Vol. 1017 Number 2

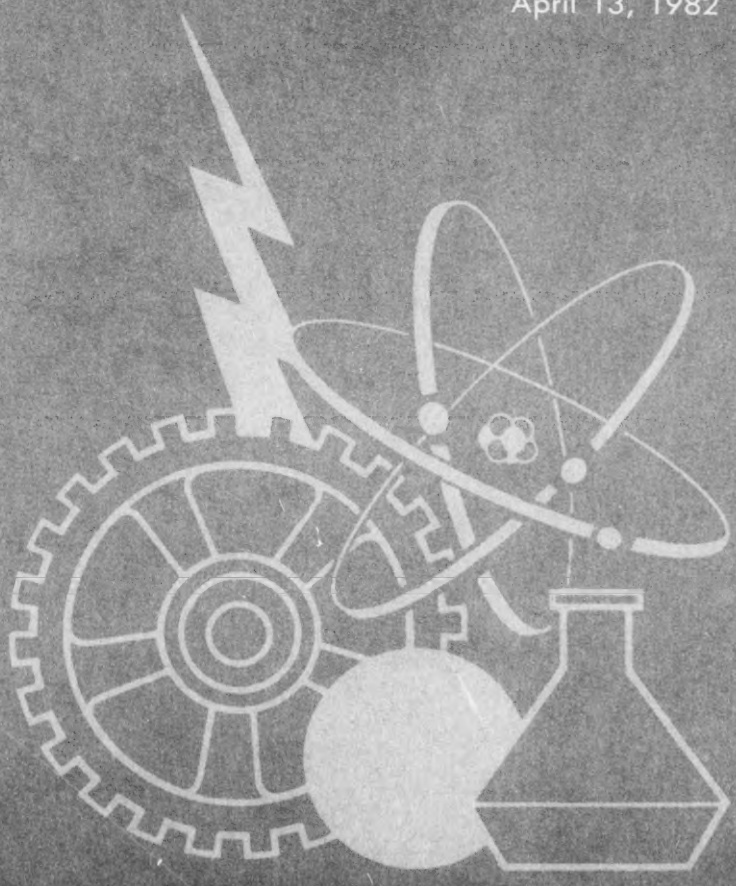
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 13, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

April 13, 1982 Volume 1017 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,871,367, Re. S.N. 332,166, Filed Dec. 18, 1981, Cl. 128/78, PELVIC BRACE, Marion E. Miller, Owner of Record: *Inventor,* Attorney or Agent: Vern L. Oldham, et al., Ex. Gp.: 335

4,044,193, Re. S.N. 335,201, Filed Dec. 28, 1981, Cl. 429/40, FINELY PARTICULATED COLLOIDAL PLATINUM COMPOUND AND SOL FOR PRODUCING THE SAME AND METHOD OF PREPARATION OF FUEL CELL ELECTRODES AND THE LIKE EMPLOYING THE SAME, Henry G. Petrow, et al., Owner of Record: *Prototech Co., Newton Highlands, Mass.,* Attorney or Agent: Nelson H. Shapiro, et al., Ex. Gp.: 111

4,226,300, Re. S.N. 315,221, Filed Oct. 26, 1981, Cl. 182/2, SELF PROPELLED AND EXTENSIBLE BOOM LIFT, Rallie P. Rallis, et al., Owner of Record: *Mark Industries, Carson, Calif.,* Attorney or Agent: Robert R. Thornton, et al., Ex. Gp.: 354

4,240,895, Re. S.N. 309,358, Filed Oct. 7, 1981, Cl. 204/290, RANEY ALLOY COATED CATHODE FOR CHLOR-ALKAI CELLS, Thomas J. Gray, Owner of Record: *Olin Corp., New Haven, Conn.,* Attorney or Agent: Arthur E. Oaks, Ex. Gp.: 116

4,277,528, Re. S.N. 344,403, Filed Feb. 1, 1982, Cl. 128/192, CERAMIC SUBSTRATE, Takao Doi, et al., Owner of Record: *Inventors,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 164

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,854,045, Reexam. No. 90/000,174, Requested: Mar. 12, 1982, Cl. 250/341, MEASURING THE DUST CONCENTRATION IN AIR, Hans Breuer, et al., Owner of Record: *Bergwerksverband GmbH, Essen, Germany,* Attorney or Agent: None, Ex. Gp.: 252, Requester: Horst Schumacher, Essen, Germany

4,021,990, Reexam. No. 90/000,173, Requested: Mar. 11, 1982, Cl. 52/714, VENEER ANCHOR AND DRY WALL CONSTRUCTION SYSTEM AND METHOD, Bernard J. Schwalberg, Owner of Record: *Hohmann Enterprises, Inc., Birmingham, Ala.,* Attorney or Agent: Philip D. Amins, Ex. Gp.: 350, Requester: Dur-O-Wal, Inc., Northbrook, Ill.

Patent Cooperation Treaty Update

Reminder Regarding Fee Increase Effective Jan. 1, 1982

The international fee amounts were increased by the PCT Assembly effective Jan. 1, 1982. These amounts are:

International Basic Fee (for the first 30 sheets of an international application)	$270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
International Designation Fee (for each State for which a national patent is sought, or for each group of States for which the same regional patent is sought	65.00

The Search fee and Transmittal fee remain at $300 and $35, respectively.

Accession by Sri Lanka and Listing of PCT Member States

On Nov. 26, 1981 Sri Lanka deposited its instrument of accession to the Patent Cooperation Treaty (PCT) with the World Intellectual Property Organization. Therefore, according to PCT Article 63 (2), Sri Lanka may be designated in international applications filed on and after Feb. 26, 1982.

List of PCT Member States

State	Ratification or Accession	Date of Ratification or Accession	Date From Which State May Be Designated
(1) Central African Republic*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Fed. Rep. of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein**	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (N. Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium**	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI Member States. A designation of any State is an indication that all OAPI States have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

**Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France and Belgium, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought for several States.

Mar. 12, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Foreign Patent Data and Services

The United States Patent and Trademark Office (PTO) has entered into a one-year exchange agreement with Derwent, Ltd. for 1982 whereby, in exchange for special compilations of patent documents, the PTO obtains an English-language abstract for each "basic" disclosure of invention contained in newly issuing foreign patent documents shortly after publication. Also, to facilitate association of each abstract with the appropriate patent document and to expedite subsequent processing of the disclosures to the classified search file, the PTO obtains, along with the abstracts, a magnetic tape record of the bibliographic data which relates to substantially all patent documents issuing worldwide. The agreement also provides for receipt by the PTO of certain other distinct services and materials.

The PTO would welcome proposals from other interested suppliers to provide the same or equivalent materials and services. Proposals received by July 1, 1982, will be evaluated and considered by the Office for implementation beginning Jan. 1, 1983.

Additional information, including copies of the PTO-Derwent agreement, may be obtained from:

James W. Shores, Director
Office of Documentation Planning, Support & Control
U.S. Patent and Trademark Office
Washington, D.C. 20231
Telephone (703) 557-3816

Mar. 15, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibiility of said applicants on moral, ethical or other grounds, should be furnished the

Commissioner of Patents and Trademarks on or before Apr. 30, 1982.

Cacciapaglia, Frank Jr., 3154 Patrick Henry Dr., Falls Church, Va. 22044
Fisher, Dean T., 6924 Perivale Park Rd., Toledo, Ohio 43617
Fox, Samuel L., 3509 Patterson St., N.W., Washington, D.C. 20015
Granger, Theodore A., 2910 Dogwood Dr., Henderson, N.C. 27536
Green, Bruce M., Barrigar & Oyen, 130 Slater St., Ottawa, Canada KIP 6E2
Halper, Robert, 3118 Calverton Blvd., Beltsville, Md. 20705
Hinson, Harrison L., 935 Douglass Dr., McLean, Va. 22101
Hopkins, John E., Barrigar & Oyen, 130 Slater St., Ottawa, Canada KIP 6E2
Kelly, Donald G., 4220 Shannon Hill La., Alexandria, Va. 22310
Mason, Dennis A., Ableman, Frayne & Rezac, 708 3rd Ave., New York, N.Y. 10017
Michell, Robert W., 7932 Maryknoll Ave., Bethesda, Md. 20817
Nelson, Verner R., Ayerst Labs., 1025 Laurentien Blvd., St. Laurent, Canada
Phillips, Roger F., 620A Commercial Ave., Ridgecrest, Calif. 93555
Ross, John R., Jr., 13020 Long Boat Way, Del Mar, Calif. 92014
Saunders, Raymond H., Gulf Canada Ltd., 800 Bay St., Toronto, Ontario, Canada
Savit, Lester J., 2600 S. 16th St., Unit 720, Arlington, Va. 22204
Slater, Robert W., 3906 Cherry Valley Rd., Woodstock, Ill. 60098
Stewart, Gordon M., Fetherstonhaugh & Co., 456-409 Granville St., Vancouver, Canada
Taylor, Hosea E., Jr., 1749 N. Portal Dr., N.W., Washington, D.C. 20012
Weinblatt, Mayer, 3326 Memphis La., Bowie, Md. 20715
Zorzoli, Franco, Bugnion S.p.A., Via Carlo Parini 81, Milano, Italy 21059

DONALD J. QUIGG,
Chairman, Committee on Enrollment.

Mar. 16, 1982.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 13, 1982

D. 261,534,	4,276,611	4,296,017	4,308,058
3,610,803	4,278,527	4,296,073	4,308,414
3,739,930	4,279,279	4,296,613	4,308,604
4,097,261	4,279,539	4,297,198	4,308,740
4,184,048	4,280,719	4,297,467	4,308,815
4,207,546	4,281,073	4,297,983	4,308,905
4,221,154	4,282,302	4,298,461	4,308,985
4,244,290	4,283,139	4,298,629	4,309,276
4,244,557	4,284,263	4,298,693	4,309,281
4,244,658	4,284,502	4,299,212	4,309,313
4,245,851	4,284,729	4,299,213	4,309,601
4,246,497	4,284,864	4,299,404	4,309,833
4,251,398	4,285,317	4,299,749	4,309,874
4,252,820	4,286,110	4,299,837	4,310,434
4,252,941	4,288,421	4,299,977	4,310,723
4,253,417	4,289,278	4,300,011	4,311,273
4,253,867	4,289,446	4,300,073	4,312,138
4,256,747	4,289,642	4,300,377	4,312,792
4,258,590	4,289,775	4,300,405	4,312,845
4,259,350	4,289,866	4,300,500	4,312,894
4,260,414	4,289,893	4,301,396	4,313,074
4,265,039	4,289,956	4,302,500	4,313,552
4,265,345	4,290,209	4,303,115	4,313,660
4,265,793	4,290,750	4,303,417	4,314,250
4,268,620	4,291,333	4,304,259	4,314,284
4,269,651	4,292,104	4,304,620	4,314,445
4,270,959	4,292,604	4,304,900	4,314,876
4,270,985	4,292,807	4,304,961	4,315,177
4,271,921	4,293,595	4,304,997	4,315,319
4,272,454	4,294,573	4,305,905	4,315,404
4,275,043	4,295,289	4,306,962	
4,275,245	4,295,855	4,307,290	
4,275,792	4,295,930	4,307,354	

Disclaimers

4,061,770.—*Alfred F. Marks,* Mentor, Ohio. FLOWABLE, AQUEOUS PESTICIDE COMPOSITIONS OF IMPROVED ACTIVITY. Patent dated Dec. 6, 1977. Disclaimer filed Feb. 18, 1982, by the assignee, *Diamond Shamrock Corp.*

Hereby enters this disclaimer to claims 1–7, inclusive of said patent.

4,244,906.—*Karl-Heinz Heinemann; Georg Michalczyk; Neukirchen-Vluyn* and *Gerd Ripkens,* Kamp-Lintfort, Germany. PROCESS FOR MAKING PHENOL-ALDEHYDE RESINS. Patent dated Jan. 13, 1981. Disclaimer filed Feb. 8, 1982, by the assignee, *Deutsche Texaco Aktiengesellschaft.*

Hereby enters this disclaimer to claims 1 to 14, inclusive of said patent.

4,301,155.—*Larry L. Larson,* Concord, Calif. INSECTICIDAL SYNERGISTIC MIXTURES OF O,O-DIETHYL-O-(3,5,6-TRICHLORO-2-PYRIDINYL)-PHOSPHOROTHIOATE AND 2,2,3,3-TETRAMETHYLCYCLOPROPANECARBOXYLIC ACID: CYANO(3-PHENOXYPHENYL)METHYL ESTER. Patent dated Nov. 17, 1981. Disclaimer filed Jan. 28, 1982, by the assignee, *The Dow Chemical Co.*

Hereby enters this disclaimer to claims 1–5 and 7 of said patent.

Dedication

Des. 254,357.—*Gregory M. Fehn,* Maumee, Ohio. BOTTLE. Patent dated Mar. 4, 1980. Dedication filed Dec. 1, 1981, by the assignee, *Owens-Illinois, Inc.*

Hereby dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 6, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-02-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-08-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	6-18-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-09-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-17-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	2-26-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-05-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-30-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director .... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-14-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-06-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	12-11-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	6-02-80

Expiration of patents: The patents within the range of numbers indicated below expire during March 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,171,131 to 3,176,313, inclusive

Plant Patents ..... Numbers 2,486 to 2,489 inclusive

REEXAMINATIONS

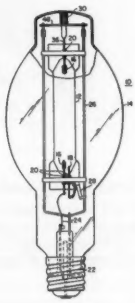
APRIL 13, 1982

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,032,816 (3rd)
SAFETY SWITCH WHICH RENDERS HID LAMP INOPERATIVE ON ACCIDENTAL BREAKAGE OF OUTER ENVELOPE

Ferdinand Rokosz, Pompton Plains, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Reexamination Request No. 90/000,029, Jul. 16, 1981.
Reexamination Certificate for Patent No. 4,032,816, issued Jun. 28, 1977, Ser. No. 649,775, Jul. 16, 1976.
Continuation-in-part of Ser. No. 609,138, Aug. 29, 1975, abandoned.

U.S. Cl. 315/73 **Int. Cl.³ H01J 7/44**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. In combination with a high-intensity discharge lamp comprising an elongated radiation-transmitting arc tube which is enclosed by and supported within a light-transmitting protective envelope which is opaque to short wavelength ultraviolet radiations, said arc tube enclosing a discharge-sustaining filling and having electrodes operatively positioned therein proximate the ends thereof, electrical lead-in means sealed through said arc tube and connected to said electrodes, electrical adaptor means affixed to the outer surface of said protective envelope to facilitate electrical connection of said lamp to a source of electrical power, and electrical conductor means electrically connecting said electrical adaptor means to said electrical lead-in means, the improvement which comprises:

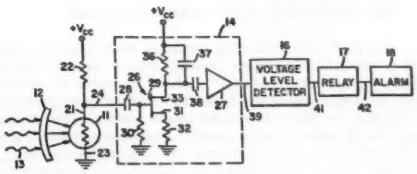
a. a make-and-break switch means included in series circuit arrangement with said electrical conductor means, said switch means including an electrical contact member having an open position in which said switch means is electrically nonconductive and said electrical contact member also having a closed position in which said switch means is electrically conductive, a spring urging said electrical contact member to the open position, and said electrical contact member being movable to the closed position against the resilient force of said spring;

b. positioning means within said protective envelope for maintaining said switch means in predetermined position within said protective envelope, and a mechanical contact member of said positioned switch means pressing against the inner surface of said protective envelope to maintain said electrical contact member in said closed electrically conductive position against the resilient force of said spring; whereby breakage of said protective envelope will permit said electrical contact member to move to said open electrically nonconductive position under the resilient force of said spring to render said lamp inoperative.

B1 3,703,718 (4th)
INFRARED INTRUSION DETECTOR SYSTEM

Herbert L. Berman, Los Altos Hills, Calif., assignor to Hoermann Corporation U.S.A., Mountain View, Calif.
Reexamination Request No. 90/000,021, Jul. 9, 1981.
Reexamination Certificate for Patent No. 3,703,718, issued Nov. 21, 1972, Ser. No. 104,667, Jan. 7, 1971.
Continuation-in-part of Ser. No. 9,315, Feb. 6, 1970, abandoned.

U.S. Cl. 340/567 **Int. Cl.³ H01J 39/00**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–6, 10, and 11 is confirmed.

Claims 7–9, having been finally determined to be unpatentable, are cancelled.

New claims 12 and 13 are added and determined to be patentable.

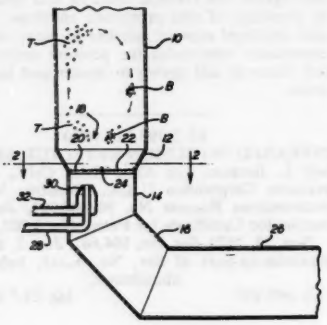
1. In an infrared intrusion detector system, an infrared sensing element adapted for producing an electrical signal corresponding to the level of the infrared radiation impinging on said element, a plurality of spaced apart reflective surfaces facing the same general direction disposed in proximity to said sensing element for gathering infrared radiation from a plurality of discrete spaced apart fields of view and focusing said radiation on said sensing element, and signal conditioning means connected for receiving the electrical signal from said sensing element, said signal conditioning means having a frequency response corresponding to the walking speed of a human being and being adapted for producing an alarm signal in response to the movement of an intruder across a boundary of one of said discrete fields of view.

B1 3,253,944 (5th)

PARTICLE COATING PROCESS

Dale E. Wurster, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Reexamination Request No. 90/000,004, Jul. 1, 1981.
Reexamination Certificate for Patent No. 3,253,944, issued May 31, 1966, Ser. No. 337,481, Jan. 13, 1964.
Continuation-in-part of Ser. No. 861,063, Dec. 21, 1959, abandoned.
U.S. Cl. 427/213 Int. Cl.[3] B05D 3/00



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of the claim is confirmed.

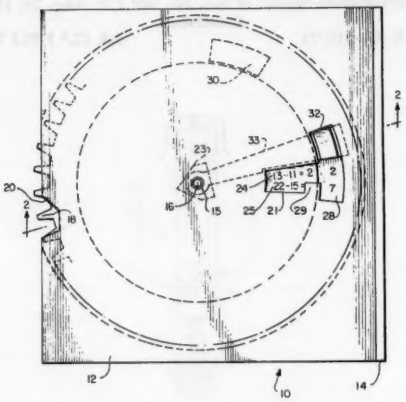
The process of coating particles with coating material in a vertically disposed coating tower, which comprises forming an air suspended bed of particles in which all particles are suspended in an upwardly flowing air stream entering the bottom of said tower, said air stream entering the bottom of said tower being substantially coextensive with the cross-sectional area of said suspended bed in said tower, imparting controlled cyclic movement to the particles with a portion of the suspended bed flowing upwardly and the other portion of the suspended bed flowing downwardly without randomness of particle motion characteristic of fluidized beds, by directing the upwardly flowing air stream into the bottom of said tower in a high velocity upwardly flowing air stream in one part of said tower in which the particles are suspended and move upwardly concurrent to the upwardly flowing high velocity air stream substantially out of contact with each other in the portion of the suspended bed subjected to said high velocity air stream and pass to the top of the downwardly flowing portion of said bed, and a low velocity upwardly flowing air stream in the other portion of said tower in which the particles move downwardly and settle through the upwardly flowing low velocity air stream in substantially weightless contact with each other and in substantially undisturbed relation in the portion of the suspended bed subjected to said low velocity air stream and pass to the bottom of the upwardly flowing portion of said bed, and directing all of said coating material into the high velocity air stream to provide for the coating of only the particles moving upwardly in said high velocity air stream.

B1 3,751,826 (6th)

DEVICE FOR THE APPLICATION OF PRINTED LEARNING PROGRAMS

Heinz Kunert, Belvenerestr. 15, Cologne, Fed. Rep. of Germany.

Reexamination Request No. 90/000,013, Jul. 1, 1981.
Reexamination Certificate for Patent No. 3,751,826, issued Aug. 14, 1973, Ser. No. 177,793, Sep. 3, 1971.
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1970, 2047599.
U.S. Cl. 434/349 Int. Cl.[3] G09B 3/02



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 is confirmed.

1. Device for the application of printed learning programs, consisting of a bottom plate, a cover plate, a rotating disk arranged between them which reveals a manually graspable circumferential toothing or the like for the rotation of the rotating disk around a central pivot, a learning program sheet arranged on the rotating disk for rotation therewith and on which are printed program problems and their solutions in sector-shaped fields, a writing surface, a sector-shaped window in the cover plate, through which simultaneously at least two successive program problems and the solution of one of the programs will be visible and through which the user can read his program solution on said writing surface, which surface is on the rotating disk, the said writing surface capable of being written on repeatedly and can be erased, a pivotal erasing device positioned between the cover plate and the bottom plate for the automatic erasing of the writing tablet in case of a rotation by 360° and also for erasing a limited angular extent of said writing surface.

REISSUES

APRIL 13, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

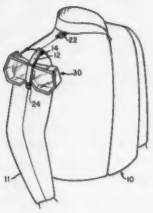
Re. 30,899
ACCESSORY HOLDER FOR USE ON ARTICLE OF CLOTHING

Robert A. Kallman, 2030 Haring St., Brooklyn, N.Y. 11229

Original No. 4,055,873, dated Nov. 1, 1977, Ser. No. 742,617, Nov. 17, 1976. Continuation-in-part of Ser. No. 690,262, May 26, 1976, Pat. No. 4,051,554. Application for reissue Sep. 26, 1978, Ser. No. 946,097

Int. Cl.[3] **A44B** *21/00;* **A41D** *1/00*

U.S. Cl. 24—3 C **17 Claims**



1. An accessory holder for an article of clothing comprising a flap member for covering a part of the clothing article, means for fixedly securing one end of said flap member at a first point on said article, a first elongated piece of fabric fastening material with fastening means thereon secured to the clothing article in at least a part of the area to be covered by the free part of the flap, a second piece of fabric fastening material with fastening means thereon on the underside of the flap having a first part secured to the underside of the flap and a second part hanging free, fastening means of both parts of said second piece of fabric fastening material facing the clothing article and engaging the fastening means on the first piece of fabric fastening material when the flap is laid down on the clothing article with the accessory being held located between the underside of the flap and second part of the second piece of fabric fastening material.

Re. 30,900
FLUID CURRENT METER

Hsing-Hua Shih, Bowie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 3,978,726, dated Sep. 7, 1976, Ser. No. 574,832, May 5, 1975. Application for reissue May 29, 1979, Ser. No. 43,408

Int. Cl.[3] **G01D** *1/00*

U.S. Cl. 73—189 **9 Claims**

5. Fluid flow measuring apparatus comprising:

A. a plurality of pairs of acoustic transducers;

B. a support ring *having a plurality of recesses and* supporting said transducers *within respective ones of said recesses*,

C. an electronics section coupled to and in signal communication with said transducers for obtaining current velocity measurements;

D. said transducers being supported by said ring such that the transducers of each said pair are acoustically coupled to one another along an acoustic path;

E. each said acoustic path being within the central portion of said ring.

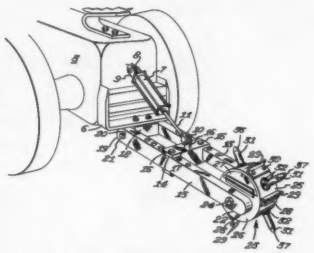
Re. 30,901
SOIL SAMPLING DEVICE

Phillip E. Boxrud, Madelia, Minn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Original No. 3,264,877, dated Aug. 9, 1966, Ser. No. 390,139, Aug. 17, 1964. Application for reissue Jul. 31, 1980, Ser. No. 174,217

Int. Cl.[3] **G01N** *1/08*

U.S. Cl. 73—864.31 **8 Claims**



7. In combination with a vehicle adapted to travel over the ground, a soil probing device for taking intermittently spaced samples of soil from a given land area and comprising, a supporting frame connected to said vehicle for up and down movement relative thereto, said frame having a mounting portion, power means for controllably raising and lowering said frame, a soil probing assembly [attached to] *rotatively mounted on* said mounting portion and positioned for engagement with the ground when said frame is lowered, said assembly having [at least one projecting tubular probe element] *a plurality of tubular probe elements projecting from the periphery of said rotatable assembly in circumferentially spaced relation* for removing a core each time [it] *a probe element* is projected into the soil, said assembly comprising also a closed sample-receiving compartment, the interior of which is in communication with the inner end of said tubular *elements* probe [element], and access means through which a multiplicity of sample cores may be removed.

Re. 30,902
PRESSURE AND TEMPERATURE COMPENSATING HYDRAULIC VALVE

William A. P. Lawrence, Simi Valley, Calif., and Robert J. Whelchel, Dunwoodie, Ga., assignors to Elevator Equipment Co., Los Angeles, Calif.

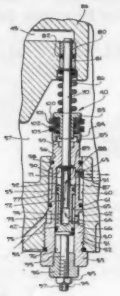
Original No. 4,194,534, dated Mar. 25, 1980, Ser. No. 896,971, Apr. 17, 1978. Application for reissue Dec. 24, 1980, Ser. No. 219,828

Int. Cl.[3] **F16K** *11/10*

U.S. Cl. 137—625.39 **11 Claims**

1. A compensating valve device mountable in a housing for modification of the flow of hydraulic fluid in a hydraulic circuit wherein a hydraulic fluid supply to the housing has a pressure in excess of ambient pressure, said valve device comprising a valve body having mounting means for positioning the valve device on said housing a valve chamber in said body,

a valve stem reciprocatably mounted in said body, said stem having a piston at one end responsive to pressure of said hydraulic fluid, means forming a cavity in said stem adjacent the other end having an opening thereto, a valve seat member in said chamber, said valve seat member having a passage in communication with the cavity of said stem through said opening, a divider in said chamber forming respective inflow and outflow chamber sections, and port means serving as a valve element for engagement with said valve seat member and in communication between said passage and said outflow chamber section, said port means having a progressively variable capacity adjustment in response to movement of said piston due to changes in pressure of said hydraulic fluid supply



whereby to vary fluid flow between said inflow and outflow chamber sections.

7. A compensating valve device as in claim 1 wherein there is a temperature responsive member acting between said stem and said valve body, said temperature responsive member being responsive to the temperature of hydraulic fluid which passes through said valve chamber, said temperature responsive member having [a retracting] *an expanding* reaction at relatively lower fluid temperatures, and [an expanding] *retracting* reaction at relatively higher fluid temperatures tending to [resist] *assist* depression of the piston whereby to [enhance] *reduce* flow of said hydraulic fluid through said chamber sections when subjected to said relatively higher fluid temperatures.

Re. 30,903
COMPUTER CONTROLLED TELEPHONE ANSWERING SYSTEM

Ronald P. Vicari, Elmwood Park, N.J., and Barry Yampol, Oyster Bay, N.Y., assignors to Graphic Scanning, Inc., Englewood, N.J.

Original No. 3,987,252, dated Oct. 19, 1976, Ser. No. 591,233, Jun. 27, 1975. Continuation-in-part of Ser. No. 392,634, Aug. 29, 1973, abandoned. Application for reissue Oct. 17, 1978, Ser. No. 952,067

Int. Cl.[3] **H04M** *3/50;* **H04Q** *3/54, 3/60*

U.S. Cl. 179—27 FH **15 Claims**

13. A computer controlled telephone answering system serving the subscribers of a telephone company central office comprising:

(a) a central site for answering the telephones of subscribers of a telephone company central office;

(b) a plurality of subscriber telephone lines;

(c) a concentrator located at said central site and responsive to said subscriber telephone lines;

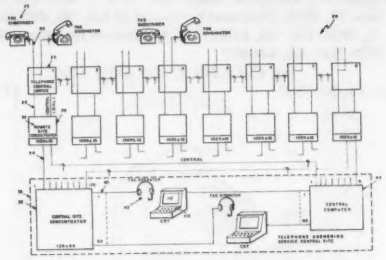
(d) a plurality of operator positions at said central site each including telephone receiving and transmitting means for answering calls;

(e) visual display means at each of said operator positions for displaying alphanumeric data pertaining to an individual subscriber;

(f) digital computer means at said central site coupled to the visual display means of each of said operator positions;

(g) line scanning means for scanning each of said subscriber telephone lines to determine whether a line should be answered;

(h) coupling control means for controlling the coupling of a a signal of a line to be answered via said central site concentrator to an operator position, said coupling control means being included in said digital computer means; and



(i) data storage means included in said digital computer means for storing and recalling data relative to subscriber telephone lines;

(j) whereby said digital computer means selects and transmits to the visual display means of said operator position alphanumeric digital data from said data storage means which is relative to a called subscriber line to permit the operator to answer the called line.

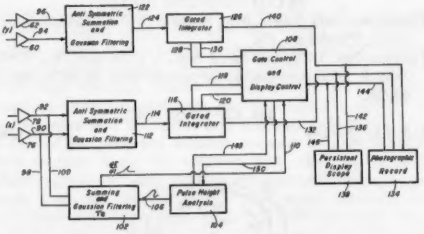
Re. 30,904
CONTROL SYSTEM FOR GAMMA CAMERA

Don W. Miller, Westerville, and Mark S. Gerber, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Original No. 4,055,766, dated Oct. 25, 1977, Ser. No. 680,754, Apr. 27, 1976. Application for reissue Oct. 15, 1979, Ser. No. 85,070

Int. Cl.[3] **G01T** *1/22*

U.S. Cl. 250—370 **41 Claims**



1. In a system for imaging the distribution of a radiation emitting isotope within a region of interest, said system including solid state strip array type detector means having strip regions which are operatively associated with impedance networks, said networks being arranged to receive radiation-induced charges in spatial disposition corresponding with the interaction location of said radiation upon said strips, said charge receipt being time variant in correspondence with said position of interaction to exhibit a collection time constant, τ_D, the improvement comprising:

amplifier means coupled with said impedance network

means and having output signals corresponding with said charge receipt;

first summing means responsive to said amplifier means output signals for deriving a spatial signal corresponding to the spatial orientation of a said interaction location;

second summing means responsive to said amplifier means output signals for deriving an energy signal of value corresponding with the spatial signal;

evaluating means responsive to said second summing means energy signal for evaluating the peak value of said energy signal over a time, t_e, and having a select output when said energy signal peak value lies within predetermined limits;

means for intergrating said spatial signal over a time, t_s, to derive an integrated spatial signal, said time, t_e, being greater than said time t_s;

readout means responsive, when actuated, to receive said integrated spatial signal and derive perceptible information corresponding thereto; and

control means for regulating an operational cycle of said system including the actuation of said readout means only upon the occurrence of said evaluating means select output.

PLANT PATENTS

GRANTED APRIL 13, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,837

NORWAY MAPLE—POND CULTIVAR

Rodney P. Bailey, St. Paul, Minn., assignor to Bailey Nurseries, Inc., St. Paul, Minn.

Filed Feb. 22, 1980, Ser. No. 123,774

Int. Cl.[3] **A01H** *5/12*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of *Acer platanoides,* substantially as illustrated and described, characterized by its general similarity to the common *Acer platanoides,* but being distinct therefrom by (1) a marked propensity to branch at an early age, (2) an increased vigor which is manifest by an increased height and trunk diameter during the first year following budding, (3) the formation of darker green leaves having a tinge of redness which commonly are slightly cupped in configuration, and (4) the exhibition of less pronounced lenticels.

4,838

ODONTIODA ORCHID PLANT

Maurice Lecoufle, and Michel Vacherot, both of Boissy St. Leger, France, assignors to Les Petite Fils et Fils de Vacherot & Lecoufle, Boissy St. Leger, France

Filed May 21, 1980, Ser. No. 151,945

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new Odontioda orchid plant substantially as herein shown and described, distinguished in particular by its distinctive shape and the red-brown oranged coloring of the sepals, petals and labellum, and by the fringed white margins and tip ends of the petals and labellum.

PATENTS

GRANTED APR. 13, 1982

ERRATA

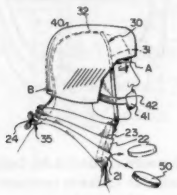
For CLASS	See PATENT NO.
172–049	4,324,123
355–065	4,324,474
356–352	4,324,475
376–175	4,324,614
376–267	4,324,615
376–203	4,324,616
376–405	4,324,617
376–434	4,324,618
376–290	4,324,619
430–063	4,324,622
521–044	4,324,705
523–149	4,324,706
524–173	4,324,707
524–599	4,324,708
523–210	4,324,709
524–076	4,324,710
523–172	4,324,711
524–767	4,324,712
523–457	4,324,713
524–113	4,324,714
523–400	4,324,715
524–761	4,324,716
524–244	4,324,717
524–108	4,324,718
261–112	4,324,749
428–472	4,324,803
429–209	4,324,828
521–054	4,324,835
426–422	4,324,840
373–039	4,324,942
373–072	4,324,943
373–105	4,324,944
372–094	4,325,033
372–050	4,325,034
370–091	4,325,147

PATENTS

GRANTED APRIL 13, 1982

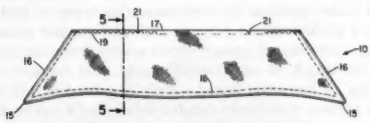
GENERAL AND MECHANICAL

4,324,003
THROAT GUARD
Tony Johnston, 96 Devonshire Ave., London, Ontario, Canada (N6C 2H8)
Filed Apr. 24, 1980, Ser. No. 143,510
Claims priority, application Canada, Apr. 25, 1979, 326292
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—2 **5 Claims**



1. A throat guard comprising:
(a) a discrete, continuously positionable throat covering of U-shaped bands of semirigid flat material adapted to overlapping co-act and to nest, and to dispose when nested an area of protected expanse over the throat region smaller than when unnested tough each band is continuously juxtapositioned;
(b) means for securing the bands about the neck of a person so that the bands extend over the throat region between chin and chest;
(c) means for maintaining one band in contiguous juxtaposition against the chest of the wearer; and,
(d) means for urging another one of said bands into close proximity of the chin, whereby head articulation causes the discrete bands to overlappingly co-act and to offer a continuously protective area of sheet material covering the throat region.

4,324,004
METHOD FOR MAKING FUSED COLLARS AND PRODUCT RESULTING THEREFROM
Juan A. Smith, Bowling Green, Ky.; Catherine L. Adams, and Wayne M. Adams, both of Brundidge, Ala., assignors to Union Underwear Company, Bowling Green, Ky.
Continuation of Ser. No. 930,419, Aug. 2, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,103
Int. Cl.[3] A41B *3/00*; B32B *7/08*
U.S. Cl. 2—131 **12 Claims**



7. A collar for use in garments, which is substantially immune to surface imperfections resulting from washing and other normal treatment, said collar comprising upper and lower facing strips of predetermined shape aligned in opposed relationship and a lining of said predetermined shape made of a fabric exhibiting different shrinkage than the fabric of said facing strips and aligned between said facing strips, said lining having one surface thereof secured to said lower facing strip; said collar including one edge adapted to be mounted to the garment, said edge having at least one notch therein for use as an aid in aligning said collar with respect to said garment.

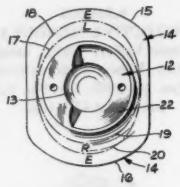
4,324,005
PROTECTIVE HEADGEAR
Betty A. Willis, Maple Valley, Wash., assignor to Charles S. Willis, Maple Valley, Wash., a part interest
Filed Jan. 18, 1980, Ser. No. 113,349
Int. Cl.[3] A42B *3/02*
U.S. Cl. 2—413 **1 Claim**

1. A protective headpiece comprising:
a skullcap means made of a thin collapsible sheet of resilient material and shaped to surround and conform to a human head and to cover all portions of the head except the facial region so that when the headpiece is worn the skullcap means receives and clings to the wearer's head and entirely supports the headpiece in place until it is pulled off by the wearer,
a shell means made of collapsible cushioning material secured to the exterior surface of the skull cap means to provide protection from impacts to the head, said shell means comprising a plurality of inflatable flap members secured to the skullcap means, said flap members being shaped and positioned to provide gas filled cushions around a wearer's head, said cushions being shaped to form a pillow located to cover the crown of the wearer's head, toroidal tubes located to extend horizontally around the head at the forehead level, and at least one curved tube located to extend horizontally around the back of the neck, the headpiece being collapsible and foldable to occupy a minimal volume during storage;
a gas delivery tube connected with the interior of each flap member;
a self-contained source of pressurized gas connected to said tube;
means to release gas from the source to inflate the flap members; and
a blow tube mechanism, including a one-way valve, connected to the gas delivery tube to provide backup means for inflating the flap members.

4,324,006
BLANK FOR ACETABULAR PROSTHESIS
John Charnley, Knutsford, England, assignor to Charnley Surgical Inventions Limited, England
Filed May 11, 1978, Ser. No. 904,752
Claims priority, application United Kingdom, May 30, 1977, 30385/77
Int. Cl.[3] A61F *1/03*
U.S. Cl. 3—1.912 **3 Claims**

1. A blank for use in the formation of an acetabular prosthesis and comprising: a body having a blind part-spherical socket,

an annular rim surrounding the socket entrance and having a flange extending outwardly of and rearwardly from the rim



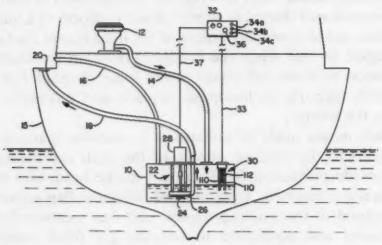
periphery, the flange being marked with cutting lines for the trimming of same to a non-uniform width.

4,324,007

SANITATION SYSTEM PARTICULARLY FOR MARINE CRAFT

Nathan Morris, Kentmorr, Stevensville, Md. 21666

Filed Nov. 15, 1979, Ser. No. 94,724
Int. Cl.³ E03D *1/00, 9/10*
U.S. Cl. 4—321 **20 Claims**



1. An active sanitation system for vehicles having a holding tank for waste material comprising a motor adapted to be mounted on the holding tank, an elongated shaft adapted to extend into the holding tank, a coupling for coupling a first end of the shaft to the motor, a pump connected to the elongated shaft adjacent to a second end for discharging waste material from the holding tank, and cutter blade means attached to the second end of the shaft adjacent to an intake port of the pump for liquefying waste material in the holding tank, the cutter blade means being pitched to direct the liquefied waste material to the intake port of the pump to assist the pump in discharging the waste material from the holding tank and being free of confining structure so that the cutter blade means has unobstructed access to the waste material.

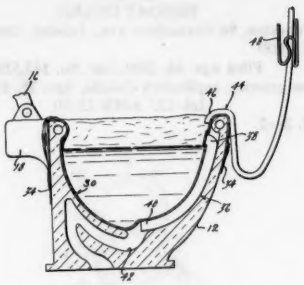
4,324,008

DISPOSABLE SITZ BATH

John W. Carr, 1158 Grove St., Maitland, Fla. 32751

Filed Jul. 17, 1980, Ser. No. 169,617
Int. Cl.³ A47K *3/22, 4/00, 3/20*
U.S. Cl. 4—445 **2 Claims**

1. A disposable sitz bath for use in conjunction with a conventional toilet comprising a flexible membrane adapted to be disposed internally of the toilet bowl, so as to be engageable with and supported by the interior surface thereof, said membrane having a peripheral edge adapted to extend above and overlie the rim portion of said toilet bowl, means for securing the peripheral edge of said membrane to an exterior surface of said toilet, and a semi-rigid non-collapsible water control tube sealably secured about an aperture in the upper portion of said membrane so as to communicate with the interior surface thereof, said tube being adapted to extend between the aperture in said membrane between said membrane and said bowl downwardly to a point adjacent to and in fluid flow communicating relationship to the discharge outlet of said toilet bowl,



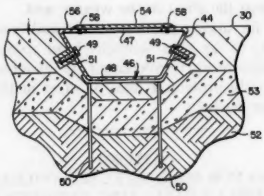
the rigidity of said water control tube being sufficient to prevent collapse thereof due to static pressure of water interiorly of said membrane in said toilet bowl.

4,324,009

SWIMMING POOL AND WATER SUPPLY SYSTEM

Roger L. Hornsby, Box H, Coolville, Ohio 45723

Filed May 1, 1980, Ser. No. 145,608
Int. Cl.³ E04H *3/18*
U.S. Cl. 4—492 **2 Claims**

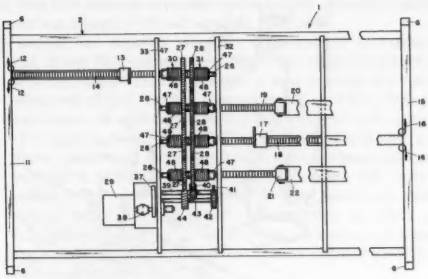


1. A swimming pool comprising, in combination, side walls and a bottom wall defining an enclosed pool area, said bottom wall including a longitudinally extending recessed portion formed along approximately the centerline of said bottom wall; an inlet water conduit means removably disposed in said recessed portion of said bottom wall and having an exposed upper surface provided with a plurality of longitudinally spaced outlet openings for communicating water to said pool area in a predetermined pattern; said inlet conduit means including a plurality of support means spaced from one another along the length of said conduit means, said support means including an upwardly facing stirrup portion disposed to receive a portion of said inlet conduit means and a pair of downwardly extending leg portions extending through said bottom wall of said pool portion and into the ground beneath said bottom wall to dispose said conduit means at a predetermined level within said bottom wall of said pool portion; and means for removably securing said conduit means to said support means and to the bottom wall of said pool portion and an outlet gutter channel formed along the upper portion of said side walls for receiving and transferring water above a predetermined level in said pool to a filter and pumping station disposed outside said pool area; and means communicating said inlet conduit means to said filter and pumping station to form a closed loop water circulation system for said pool.

4,324,010
DRIVE UNIT FOR ADJUSTABLE BEDS

Don M. Houlberg, Port Washington; Larry D. Anderson, Wisconsin Rapids, and Frank M. Damico, Hull, all of Wis., assignors to Joerns Furniture Company, Stevens Point, Wis.

Filed May 6, 1980, Ser. No. 147,217
Int. Cl.[3] A61G 7/00; F16H 5/00
U.S. Cl. 5—68 22 Claims



14. In an adjustable bed, the improvement comprising:

a frame having independently vertically adjustable supports at head and foot ends of said frame for raising and lowering the same; first means for extending and retracting said head support;

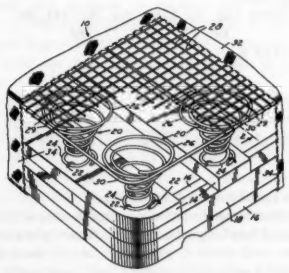
second means for extending and retracting said foot support independently of said head support extending and retracting means, whereby said bed can be adjusted to a Trendelenburg position from any bed position; and means for simultaneously moving said head and foot supports in either the same or opposite directions;

said first and second means comprising a rotary drive motor; first and second drive shafts operably connected with said head support and said foot support respectively; a drive wheel rotatably mounted on each of said drive shafts; means for operably connecting each drive wheel with said motor and rotating the same; and a clutch operably associated with each drive wheel and connecting the same with the associated drive shaft for selectively and independently manipulating said head and foot frame supports.

4,324,011
FURNITURE SPRING ASSEMBLY

Paul Cavaler, 22698 Essex Way, Southfield, Mich. 48075

Division of Ser. No. 48,641, Jun. 14, 1979, Pat. No. 4,244,089, which is a continuation-in-part of Ser. No. 922,991, Jul. 10, 1978, abandoned, which is a division of Ser. No. 790,286, Apr. 25, 1977, Pat. No. 4,120,059. This application Oct. 6, 1980, Ser. No. 194,610
Int. Cl.[3] A47C 23/04, 23/14, 23/32
U.S. Cl. 5—248 3 Claims

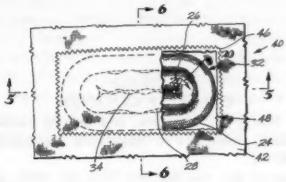


1. A mattress box spring comprising a frame, a plurality of coil springs attached to said frame such that an end coil of each said spring lies in a substantially common plane, said coils being unattached to each other in said common plane, a metal wire mesh overlying said end coils in said substantially common plane and being unattached to said springs, said mesh including border means around the periphery thereof, a cover disposed over said mesh and having a periphery draped in tension over said border means and attached to said frame, and means providing a layer of resilient elastomeric material between said mesh and each said spring such that said cover in tension cooperates with said means providing said layer to frictionally couple said springs to said mesh, and also to deaden contact noise between said mesh and said springs.

4,324,012
CUSHIONING DEVICES

Sheridan S. Cannaday, 16640 122nd SE., Renton, Wash. 98055

Filed Jun. 16, 1980, Ser. No. 159,830
Int. Cl.[3] A47C 27/12; B68G 5/00
U.S. Cl. 5—432 32 Claims



1. A light weight, air cooled, moisture resistant cushion, comprising:

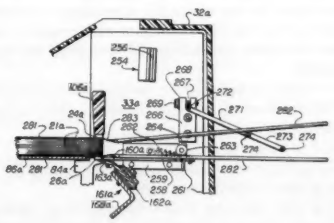
opposite facings of open mesh net fabric defining a pad receiving and restraining pocket between them; and

a pad within said pocket which is constructed from a knitted plastic fabric, rolled onto itself to form at least one roll of said fabric, wherein said opposite facings contact diametrically opposite surface portions of the roll so that any loads imposed normally to a facing of the cushion will tend to flatten the roll in a transverse direction, and wherein the strands of said knitted fabric are relatively stiff and when loaded will bend, and recover like springs when unloaded.

4,324,013
PUNCHING AND BINDING MACHINE

George Wu, San Jose, Calif., assignor to Velo-Bind, Inc., Sunnyvale, Calif.

Filed May 15, 1980, Ser. No. 150,066
Int. Cl.[3] B42C 11/06; B26D 5/08; B32B 1/00
U.S. Cl. 412—16 6 Claims



1. An apparatus for binding apertured sheets together using a first strip, a plurality of thermoplastic studs projecting from and spaced longitudinally along said first strip and a second strip formed with holes spaced longitudinally of said second

strip at intervals complementary to said studs, said apparatus being of the type having a frame having a pair of spaced sides and a platen formed to receive said second strip and to support said sheets with their apertures aligned with said holes with said first strip above said sheets with said studs extending through said apertures and said holes and protruding below said second strip, a backstop mounted on said frame at the rear and perpendicular to said platen, resilient means biasing said backstop substantially horizontally towards said platen, whereby second strips of different widths may be positioned on said platen, said backstop flexing rearward to accommodate wider second strips and which further comprises guide means on said frame guiding movement of said backstop whereby said backstop is at all times perpendicular to said platen, said backstop is removable from said frame,

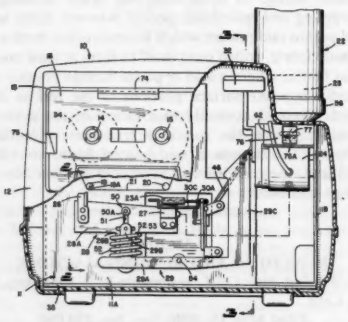
the improvement which comprises a rear platen on said frame behind said first-mentioned platen to support a first wrap-around cover and a rack on said frame to support a second wrap-around cover at a higher elevation than said first wrap-around cover.

4,324,014

CASSETTE CLEANER

William H. Stutz, Jr., Burbank, and Joseph Sandor, Reseda, both of Calif., assignors to Innovative Computer Products, Tarzana, Calif.

Continuation of Ser. No. 962,066, Nov. 20, 1978, abandoned.
This application Mar. 28, 1980, Ser. No. 134,780
Int. Cl.[3] B08B *11/02*
U.S. Cl. 15—4 **18 Claims**



1. An apparatus using a cleaning pad for cleaning magnetic tape carried in a tape cassette, comprising:

a main frame having means for supporting a cassette;

A cleaning head movably mounted with respect to said main frame to enable a cleaning pad to engage the tape in the cassette;

a drive system, coupled to the cassette when the cassette is in a fixed relationship with the frame, for moving tape in the cassette past said cleaning head;

a source of cleaning fluid;

a cleaning blade mounted on said cleaning head for scraping engagement with the tape; and

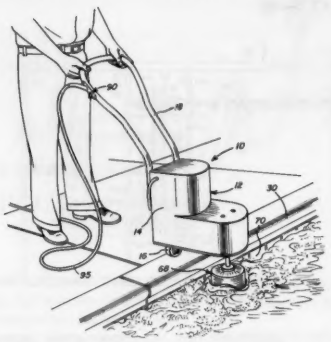
cleaning pad metering means for supplying cleaning fluid from said source to a cleaning pad during cleaning of said tape, said cleaning pad metering means including a cleaning fluid dispensing valve, said valve supplying a predetermined amount of said cleaning fluid to said cleaning pad via said metering means each time that said cleaning head is forced into cleaning engagement with the tape.

4,324,015

SWIMMING POOL TILE CLEANING DEVICE

Earl C. Head, 9461 Goodman Rd., Olive Branch, Miss. 38654

Filed Apr. 22, 1980, Ser. No. 142,769
Int. Cl.[3] E04H *3/20*
U.S. Cl. 15—49 C **6 Claims**



1. A device for cleaning the surface of a swimming pool wall comprising:

a housing;

a handle extending rearwardly from said housing;

wheels mounted transversely and in tandem relation on the rear and bottom portion of said housing;

a brush mounted on a brush shaft extending generally vertically downwardly from a forward portion of said housing;

motor means having a downwardly extending shaft and mounted in said housing directly above said wheels for rotating said brush;

drive means extending between said motor shaft and said brush shaft and including a first pulley mounted on said motor shaft and a second pulley mounted on said brush shaft;

a belt extending around said first and second pulley;

at least one mounting collar included with the brush slidably attached to said brush shaft; and

a set screw included on said mounting shaft extending radially therein for slidably mounting said collar on said shaft;

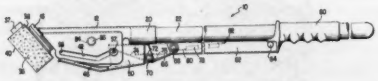
said housing being formed in two portions, one portion being a vertically extending section substantially mounted directly above the wheels containing said motor, the other portion being a forward section mounted offset from the wheels and containing said brush shaft and the motor shaft therein.

4,324,016

SELF-WRINGING MOP

Eugene O. Herbig, Belleville, Ill., assignor to Royal Maid, Inc., Hazlehurst, Miss.

Filed Aug. 22, 1980, Ser. No. 181,385
Int. Cl.[3] A47L *13/146*
U.S. Cl. 15—119 A **4 Claims**



1. A self-wringing mop comprising:

(a) a mop head member having a mop handle attached to one end of said head member and a carrier plate attached to the other end thereof, said head having two depending, spaced-apart side walls, each of said side walls having an elongated slot formed therein substantially parallel to said head portion;

(b) an elongated cleaning element attached to said carrier plate,

(c) a squeeze plate having a forward cleaning element contacting portion positioned between said side walls and slidably mounted in said slot between ends thereof and a rearward portion,

(d) a hand contactable element slidably engaging said mop handle,

(e) first link member pivotably connected at one end to said rearward portion of said squeeze plate, and

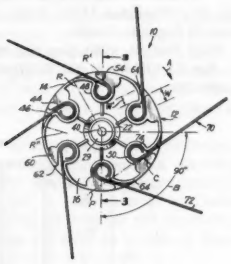
(f) second link member pivotably connected to said other end of said first link member and to said hand contactable element, said pivotal connection at said one end and said other end of said first link member being such that sliding movement of said hand contactable element will cause said squeeze plate, upon reaching said end of said slot, to pivot toward said cleaning element and continued sliding movement of said hand contactable element will cause said first link member to continue to pivot relative to said squeeze plate and said second link member to effect a substantial increase in the mechanical advantage and thus the squeezing force transmitted by said squeeze plate to said cleaning element.

4,324,017

ROTARY DEVICE FOR TREATING WORK SURFACES

John S. Viehe, 692 Talamini Rd., Bridgewater, N.J. 08807

Filed Sep. 16, 1980, Ser. No. 187,714
Int. Cl.³ A46D *9/02*
U.S. Cl. 15—198 **14 Claims**



1. A rotary device for treating a work surface, comprising a generally cylindrical hub body having a central axis and adapted for rotation in one direction about said axis, said hub body comprising:

an integral closed end wall and an open opposite end, said closed end wall having a central opening;

an axial passage terminating at said central opening to receive an axial bolt for rotating said hub body; and

a generally cylindrical, serpentine wall integral with said end wall and adapted to receive and support springy fingers in chordal positions with respect to said hub body, with said fingers extending outwardly in a direction opposite to said one direction of rotation, said serpentine wall having:

outer circumferentially spaced cylindrically curved first wall sections,

outer curved second wall sections merging smoothly with said first wall sections to provide bearing surfaces for said springy fingers when applied to said work surface while said hub body is rotated in said one direction,

inner flat third wall sections merging smoothly with said second wall sections defining guides for said springy fingers, and

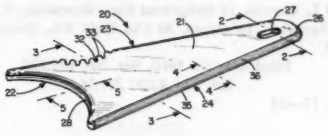
curved fourth wall sections merging smoothly with said third wall sections and defining inner cylindrical sleeves substantially tangential to said third wall sections for retaining in said sleeves knuckles at inner ends of said fingers.

4,324,018

PAINT EQUIPMENT CLEANING TOOL

Sven O. Olsson, 7951 Chicago Ave. South, Minneapolis, Minn. 55420

Filed Apr. 17, 1980, Ser. No. 141,065
Int. Cl.³ B44D *3/00*
U.S. Cl. 15—236 R **17 Claims**



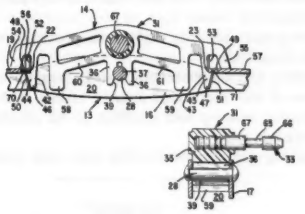
1. A paint applicator cleaning tool comprising: a flat base having a first side with a first arcuate notch having uninterrupted edges and curved to substantially conform to the outer perimeter of a portion of a standard paint roller; said base having a second side with a second arcuate notch having edges with a plurality of teeth and curved to substantially conform to the outer perimeter of a portion of a standard paint roller; said base having a third side having a tapered surface forming an elongate linear edge; an elongate linear bead located on said linear edge.

4,324,019

WINDSHIELD WIPER CONNECTING PIN ADAPTOR

Michael G. Mohnach, and William H. Harbison, both of Valparaiso, Ind., assignors to The Anderson Company of Indiana, Gary, Ind.

PCT No. PCT/US80/00573, § 371 Date May 13, 1980, § 102(e) Date May 13, 1980, PCT Pub. No. WO81/03308, PCT Pub. Date Nov. 26, 1981
PCT Filed May 13, 1980, Ser. No. 230,970
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **8 Claims**



1. In a wiper blade assembly (**10**) with a yoke (**13**) having a pair of spaced lateral walls (**16,17**) defining an opening (**20**) therebetween having a shoulder (**22,23**) at each end and a cross rivet (**28**) extending between the lateral walls (**16,17**) within the opening (**20**) and providing a center mounted pin connection for a wiper arm (**11**), a connecting pin adaptor (**14**) for converting the cross pin connection to a side mounted pin connection comprising a body (**30**) having a top portion (**31**) and a mounting portion (**32**), and a connecting pin (**33**) having an axis extending laterally outward from said top portion (**31**), said connecting pin being adapted for connection to a wiper arm (**11**), said mounting portion (**32**) having a transverse slot (**37**) in the midportion adapted to receive the cross rivet (**28**) therein and a pair of deflectable claws (**42,43**) depending from opposite ends of said top portion (**31**), each deflectable claw having a portion (**44,45**) facing in a direction transverse to the axis of the

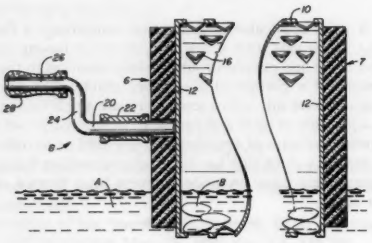
pin and adapted to engage one of said shoulders (22,23), whereby the mounting portion (32) of the connecting adaptor (14) is inserted into the opening (20) over the cross rivet (28) with the claws (42,43) being deflected longitudinally inward until the claw portions (44,45) deflect outwardly to engage the shoulders (22,23) to hold the adaptor (14) in position with the connecting pin (33) extending laterally from the yoke (13) above one lateral wall thereof.

4,324,020

MUSSEL WASHER

Richard L. Garwin, 16 Ridgecrest East, Scarsdale, N.Y. 10583, and Harold L. Friedman, 90 Old Field Rd., Setauket, N.Y. 11733

Filed May 22, 1980, Ser. No. 152,233
Int. Cl.[3] A22C *29/04*
U.S. Cl. 17—51 18 Claims



15. A method for cleaning shellfish, particularly bivalve mollusks such as mussels, comprising the steps of:

providing a rotatable container, said container having an interrupted interior surface for causing objects placed therein to be drawn partially up the side of said container when said container is rotated;

depositing said shellfish within said container;

supporting said container relative to a body of water by floating said container with sufficient buoyancy so that said container, which has a plurality of holes for fluid communication with said water, is only partly submerged within said water;

rotating said container with means providing said buoyancy about an axis;

tumbling said shellfish within said container by the interaction of said interrupted interior surface with said shellfish thereby causing said shellfish to be cleaned by mutual abrasion; and

removing said cleaned shellfish from said container.

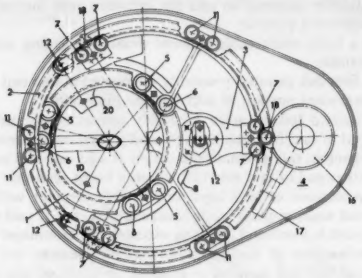
4,324,021

DEVICE FOR DISPOSING A CARD ROVING IN A FIXED BOX

Angelo Carrera, Via Del Chioso, Trezzo Sull'Adda, Italy

Continuation-in-part of Ser. No. 869,162, Jan. 13, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,746
Claims priority, application Italy, Jan. 13, 1977, 19251 A/77
Int. Cl.[3] B65H *54/80*
U.S. Cl. 19—159 R 11 Claims

1. A device for disposing in a fixed box a roving originated from the exit cylinders of cards comprising as components a planet gear, eccentrically mounted in respect to the fixed box, a first and a second sun gears coaxial with the fixed box, the planet gear being provided with a tube in which the roving is fed to at the tube upper end and discharged, at the tube lower end, according to epicycloidic curves, the rotation of the first sun gear causing the planet gear to revolve about its axis, the rotation of the second sun gear causing the planet gear to revolve about the fixed box axis, characterized by that the planet gear and sun gears show cylindrical vertical surfaces



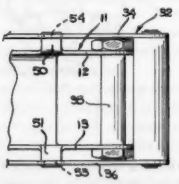
which constitute the tracks for the axial and radial rolling bearings.

4,324,022

RATCHET BUCKLE HAVING REINFORCEMENT STRENGTHENING MEANS

Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Jun. 16, 1980, Ser. No. 159,958
Int. Cl.[3] B25B *25/00;* B65D *67/02*
U.S. Cl. 24—68 CD 5 Claims



1. In a ratchet buckle for use in tightening and tensioning strap including a frame member with a pair of oppositely positioned arms, a reel member rotatably supported between said arms, a pair of ratchet wheels fixedly attached to said reel member in spaced apart relationship and a latching plate slidably mounted between said arms for latching said ratchet wheels when they are not being rotatably driven; and a lever member having a pair of oppositely positioned arms rotatably mounted on the reel member and a ratchet drive plate slidably mounted between the lever member arms which engages and drives said ratchet wheel when the lever member is actuated, the improvement being means for providing reinforcement of the frame member by the handle member when the handle member is in a predetermined finally closed position relative to the frame member comprising

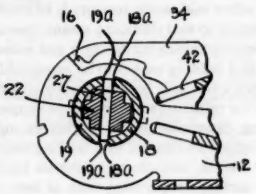
tabs extending from each of the arms of one of said members towards the nearest arm of the other of said members, and

notches formed in the arms of each of the other of said members, each said notches being positioned opposite an associated one of said tabs in mating engagement therewith when said handle member is in said finally closed position.

4,324,023
RATCHET BUCKLE HAVING REINFORCING SPREADER BAR INSERT

Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Jun. 18, 1980, Ser. No. 160,636
Int. Cl.[3] B25B *25/00*; B65D *67/02*
U.S. Cl. 24—68 CD 5 Claims



1. In a ratchet buckle for tightening and tensioning a strap, said buckle including a frame member having a pair of oppositely positioned arms, a reel member and a pair of ratchet wheels rotatably mounted between said arms; a lever member having a pair of oppositely positioned arms rotatably mounted on said reel member and a ratchet drive plate which engages the ratchet wheels such that when the lever member is actuated, the reel member is rotatably driven; the improvement wherein said reel member comprises a pair of oppositely positioned inwardly curving plates with their opposite edges spaced apart from each other and reinforcement means for reinforcing said plates comprising

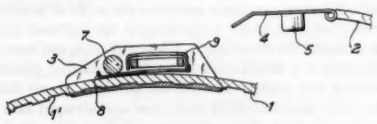
a spreader bar member having an elongated longitudinal slot formed therethrough, a pair of end wall portions running substantially normal to the longitudinal axis of the slot, and a pair of wing portions extending outwardly from the opposite ends of each of said end wall portions in directions substantially normal to the longitudinal axis of said slot,

said spreader bar member being fitted between the oppositely positioned curving plates with the wing portions extending into the spaces between the opposite edges of the plates, the slot in said spreader bar member being aligned with the spaces between the edges of said plates, thereby permitting the strap to be reeved therethrough.

4,324,024
ADJUSTING AND LOCKING DEVICE FOR WATCH BRACELETS

Fernando Fontana, Via Piave, 96-Sesto Calende (Varese), Italy

Filed Sep. 28, 1979, Ser. No. 80,779
Claims priority, application Italy, Oct. 2, 1978, 22931/78 [U]
Int. Cl.[3] A44B *11/12, 11/26*
U.S. Cl. 24—170 1 Claim

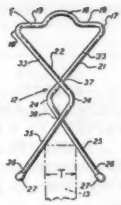


1. An adjusting and locking device for a watch bracelet comprising an adjusting and locking slide, said slide being connected to an end of one half of the bracelet and comprising a bottom, two opposite sides said device further comprising, a plate pivotally connected to an end of a second half of the bracelet, a rotatable eccentric shaft arranged transversely to the slide to control anchoring pressure of said slide to the bracelet half portion, a blade arranged between the eccentric shaft and the bracelet surface to increase contact pressure surfaces, a tooth, said tooth projecting from the inner surface of the plate, a bridge element, said bridge element arranged transverse the opposite edges of the slide, and provided with a cutout and a detent elastically arranged transverse to the opposite sides of the slide, below the bridge element, having an end extending outside the slide and being provided with a cutout corresponding to the cutout of the bridge element and wherein the tooth of the plate is received and retained.

4,324,025
CLAMP

Edward W. Apri, 998 Lehigh St., Altadena, Calif. 91001

Filed Feb. 19, 1980, Ser. No. 122,150
Int. Cl.[3] B42F *1/02*; A44B *21/00*
U.S. Cl. 24—261 R 4 Claims



1. A wire clamp comprising a head, a hanging segment on the head, L-shaped limbs extending from the head at each side thereof, said limbs having upper straight shanks crossing one another, and lower straight shanks crossing one another, said crossings being in substantially the plane of the head, a pressure elbow defined at the juncture of the upper and lower shank of each limb, and a pressure foot on each lower shank, each of said lower shanks being substantially straight throughout its entire length from elbow to pressure foot, and said lower shanks further diverging one from the other away from said elbows.

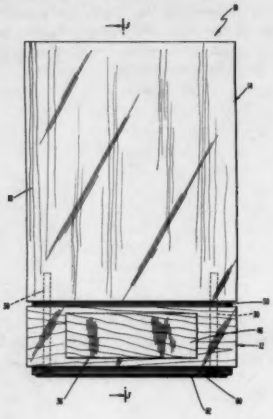
4,324,026
CREMATION URN WITH READILY ACCESSIBLE MEMORABILIA COMPARTMENT

William K. Craft, Cincinnati, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Feb. 6, 1981, Ser. No. 232,200
Int. Cl.[3] A61G *17/00*
U.S. Cl. 27—1 14 Claims

1. A cremation urn comprising a decorative housing forming therein a first internal chamber for receiving the cremated remains of a deceased, and means for closing said first chamber and concealing it from view, said housing forming therein a

second internal chamber separate from said first chamber and sized to receive objects of memorabilia, and manually openable



means for closing said second chamber and concealing it from view.

4,324,027

MACHINE INCLUDING A CLAMPING DEVICE FOR LOCATING A WORKPIECE IN A GIVEN PROCESSING POSITION

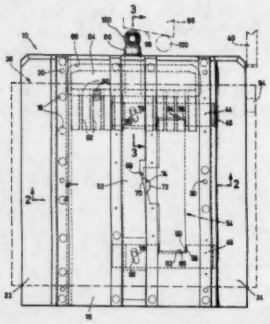
Friedrich Burkhardt, Brunnenweilerstr. 13, 7332 Eislingen/Fils, and Hans Staiger, Oechslinstr. 32, 7320 Göppingen, both of Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 55,942

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828559

Int. Cl.³ B23Q *41/02*

U.S. Cl. 29—33 P **14 Claims**



1. In a machine including clamping device for locating and holding a workpiece at a processing station and locating and releasing a workpiece at a changeover station, said changeover station including a stationary stop abutment, comprising:

holding means mounted on a bed of a machine table means moving said holding means along Y axes into and out of working relationship with the processing station and the changeover station; said holding means having rectilinear guide means thereon including spaced, parallel guide surfaces;

a support means for supporting a workpiece, said workpiece support means being slidable on said guide surfaces of said holding means along its rectilinear length parallel to a longitudinal axis; said workpiece support means including:

guide surface means adapted to be movable along the longitudinal axis of said rectilinear guide means, said workpiece support means having a complementary recess defined in part by two lateral sides; and

clamping located in and means adapted to be movable transversely to said rectilinear guide means of said holding means, said clamping means being located solely within said recess when said work support is in overlying position with respect to said clamping means, operating means for said clamping means including a rod extending from one side of said holding means to be engageable with said stop abutment when said holding means is at the changeover station for releasing said workpiece support means to permit sliding movement of said workpiece support along said parallel guide surfaces of said holding means onto the changeover station, said clamping means having at least one mating surface cooperating with at least one of said lateral sides on said workpiece support means.

4,324,028

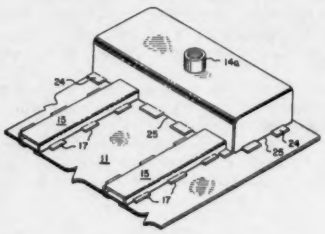
METHOD OF FABRICATING A SOLAR ABSORBER PANEL

Asbjorn M. Severson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 836,803, Sep. 26, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,767

Int. Cl.³ B23P *15/26*; B23K *31/00*

U.S. Cl. 29—157.3 C **4 Claims**



1. A method of fabricating a solar flat plate absorber panel having an absorber plate which itself forms part of a duct system for conveying heat from the absorber plate to a heat utilization system comprising the steps of:

providing a plurality of spaced slits in said absorber plate in a predetermined pattern;

providing a plurality of preformed elongated substantially single-thickness, recessed members the walls of which are formed with relatively large integral tab portions including straight tabs extending in a first direction and bent tabs extending in a direction at an angle to said first direction;

assembling said preformed recessed members to one side of said solar absorber plate such that said straight tabs are inserted through said slits and said bent tabs abut the surface of said absorber plate to form therewith manifolds and connecting ducts in a predetermined pattern wherein said absorber plate itself forms one wall of the ducts;

folding said straight tabs flatly against said absorber plate to interlock said recessed members to said absorber plate and to present a substantially flat surface for receiving solar energy; and

sealing junctures of the duct system formed by said recessed members and said absorber plate and between said recessed members to render said duct system fluid-tight.

4,324,029

APPARATUS FOR RETRACTING FLATS FROM THE CAST IRON FLAT BARS OF CARDING MACHINES

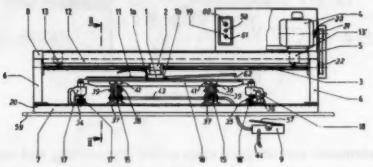
Stephan Geisser, Oberriet, Switzerland, assignor to Graf & Cie. A.-G., Rapperswil, Switzerland

Filed Dec. 11, 1979, Ser. No. 102,448

Claims priority, application Switzerland, Aug. 14, 1979, 7436/79

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—239 8 Claims



1. An apparatus for retracting flats from the elongated flat bars of a carding machine, said apparatus comprising:

a support means for supporting an elongated flat bar so that its longitudinal axis is supported in a predetermined, fixed position, the flat bar having a flat mounted thereon for removal therefrom;

guide means connected to said support means and having a guideway substantially parallel to and spaced from the longitudinal axis of the supported flat bar;

a retracting wedge mounted on said guide means for bidirectional movement in said guideway substantially parallel to the longitudinal axis of the supported flat bar;

said retracting wedge having a flat bottom surface and first and second separating edges on opposite longitudinal ends thereof, each of said separating edges defined by the intersection at an acute angle of a wedge surface and said bottom surface;

said guide means supporting said retracting wedge so that said opposite ends thereof are aligned along the longitudinal axis of the supported flat bar with said separating edges positioned along a line intermediate the flat to be removed and its associated flat bar; and

drive means coupled to said retraction wedge to cause said retraction wedge to move longitudinally in a first direction or a second direction along said guideway to cause said first or second separating edge to enter between the flat to be separated and its flat bar to thereby separate and remove the flat from the flat bar.

4,324,030

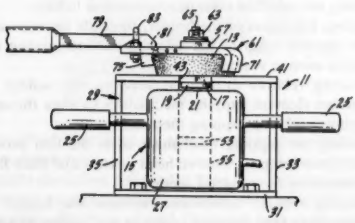
APPARATUS FOR REMOVING A GRINDING WHEEL

Juan A. Diaz, 764 Spring St., Aurora, Ill. 60505

Filed Apr. 17, 1980, Ser. No. 141,113

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—240 4 Claims



1. An apparatus for use in removing and replacing a grinding wheel of a portable industrial grinder of the type having an output shaft, a grinding wheel support sleeve on the output shaft, a non-circular collar formed on the sleeve, and laterally extending handles, said apparatus including:

an upstanding housing having a top wall with a slot therein, which slot is open at one end and is dimensioned to receive and engage the non-circular collar of the shaft support sleeve of the portable grinder with the grinding wheel being supported on the top wall,

said housing having an opening in at least one side thereof to permit the portable grinder to be positioned in the housing below the slotted top wall thereof,

a grinding wheel clamp adapted to engage the grinding wheel when it is supported on the top wall of said housing, with the grinding wheel clamp having two fixed fingers which engage the periphery of the grinding wheel at circumferentially spaced locations thereon and a movable finger circumferentially spaced relative to the two fixed fingers, which movable finger can be moved in and out of clamping engagement with the grinding wheel,

said movable finger being formed as part of an arm which can be used as a handle to rotate the heel clamp and thereby unloosen the grinding wheel from the shaft of the portable grinder, and

a support arm which extends over the top wall of the housing and is pivotally mounted relative to the housing for rotation about a vertical axis, said grinding wheel clamp being pivotally connected to said support arm and slidable along the length of a portion of the support arm.

4,324,031

BATTEN SEAMING MACHINE

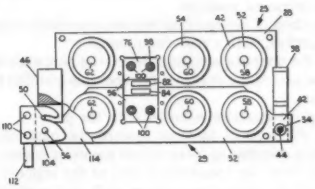
Eric H. Isenhoff, Angola, Ind., assignor to Roof Systems, Inc., Grand Rapids, Mich.

PCT No. PCT/US79/00628, § 371 Date Jun. 30, 1980, § 102(e) Date Jun. 30, 1980

PCT Filed Aug. 15, 1979, Ser. No. 164,072

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—243.58 19 Claims



1. A seaming machine for securing a batten having inwardly extending side flanges to an upstanding roof rib having horizontally-extending webs, said machine comprising:

a housing including first and second sections pivotable between an opened and closed position about a vertical axis;

releasable locking means for securing said first and second sections in the closed position whereby said machine is adapted to ride on an upstanding roof rib;

at least one pair of horizontally-disposed rollers each including a driving portion adapted to engage a side surface of the upstanding roof rib and a forming surface adapted to engage a flange on a batten for bending said flange upwardly against a horizontally-extending web on said roof rib, one of each of said pair of rollers being mounted in said first and second sections of said housing to thereby engage the opposite side surfaces of said roof rib when the housing is in a closed position to drive said machine along the rib; and

spring-biased vertically-arranged rollers adapted to crimp the flange on the batten against the horizontally-extending web on the upstanding roof rib, said vertically-arranged rollers including at least one upper roller for engaging a top surface of said batten and a pair of lower rollers for

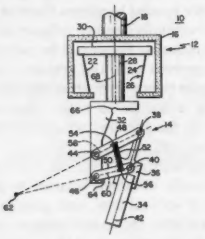
engaging said flanges extending from opposite sides of the upstanding roof rib.

4,324,032

OPERATOR MEMBER ERECTION SYSTEM AND METHOD

Richard E. Gustavson, Wellesley Hills; Craig C. Selvage, Lexington, and Daniel E. Whitney, Arlington, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 5, 1980, Ser. No. 146,344
Int. Cl.³ B23Q *17/00*; G01B *3/22*; B25B *27/14*; B25J *3/00*
U.S. Cl. 29—407 **28 Claims**



1. An insertion system including an operator member erection system comprising:

an operator member having a longitudinal axis;

support means for defining a remote center of compliance laterally spaced from said longitudinal axis of said operator member and including a support member and means for interconnecting said operator member with said support member for enabling said operator member to move about a remote center to vary the orientation of the operator member longitudinal axis relative to said support member as said operator member moves between an extended and a retracted position.

27. A method of engaging an operator member, carried by a support member, with a part comprising:

moving the operator member toward the part with the longitudinal axis of the operator member non-parallel to that of the part;

engaging the operator member with the part;

moving the support member toward the part causing the operator member to rotate about a remote center laterally spaced from the longitudinal axis of the support member to erect the operator member with its longitudinal axis generally aligned with that of the part; and

restricting further rotation of the operator member and fixing it in the erected position engaged with the part.

4,324,033

GAPPING SLIDE FASTENER ELEMENTS ON MEMBERS WOVEN IN TAPE EDGES

Norman W. MacFee, Conneaut Lake, Pa., assignor to Talon, Inc., Meadville, Pa.

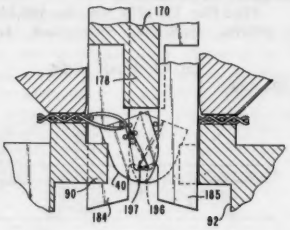
Filed Aug. 4, 1980, Ser. No. 175,097
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—408 **6 Claims**

1. A method of gapping a slide fastener stringer which includes a woven tape, a plurality of spaced fastening elements, and longitudinal connecting and supporting means joined with and extending between the fastening elements, the tape having pluralities of loops of weft thread segments passing around the connecting and supporting means, the method comprising the steps of

cutting the connecting and supporting means on opposite sides of each fastening element of a group of fastening elements to be removed, and

removing the group of fastening elements and severed ends of the connecting and supporting means from between the loops of weft thread segments,

said removing including pivoting the group of fastening



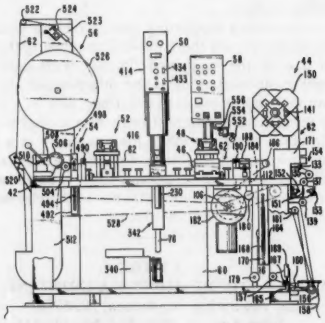
elements and severed ends of the connecting and supporting means about an axis extending parallel to the tape and spaced from the tape and the connecting and supporting means.

4,324,034

METHOD AND APPARATUS FOR GAPPING AND REINFORCING SLIDE FASTENER STRINGERS

Grant E. Berry, Cochranton; Wayne A. Becker, Meadville; Karl E. Bahr, Meadville; George J. Scagnelli, Meadville; Frank J. Molnar, Meadville; Ronald K. McDonald, Jamestown, and Harry F. Manning, Meadville, all of Pa., assignors to Talon, Inc., Meadville, Pa.

Filed Dec. 27, 1979, Ser. No. 108,251
Int. Cl.³ B21D *53/52*
U.S. Cl. 29—410 **14 Claims**



1. A method of gapping and reinforcing a selected section of a slide fastener stringer comprising the steps of

aligning the selected section relative to a holder;

gripping, by means of the holder, the slide fastener stringer on opposite ends of the selected section leaving the selected section exposed;

producing relative movement between the holder and a fastener element gapping mechanism to align the selected section with the gapping mechanism;

operating the gapping mechanism after the first producing movement step to remove head portions of slide fastener elements in the selected section;

producing relative movement between the holder and a reinforcing tape segment applying mechanism to align the selected section with the reinforcing tape segment applying mechanism; and

operating the reinforcement tape segment applying mechanism after the second producing movement step to secure

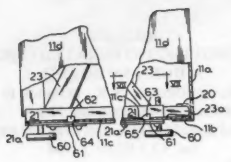
a segment of reinforcing tape on the selected section of slide fastener stringer.

4,324,035

METHOD OF ATTACHING A REMOVABLE CABINET FOR FRONT-SERVICEABLE APPLIANCES

Robert B. Sherer, St. Joseph Township, Berrien County, and Robert M. Weir, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 72,441, Sep. 4, 1979, Pat. No. 4,254,640.
This application Aug. 20, 1980, Ser. No. 179,761
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—434 **3 Claims**



1. A method of attaching a cabinet wrapper having two vertical sides each having a bottom flange with apertures therein, a vertical front having a bottom flange, and a top, to a domestic appliance having a cabinet base frame with upwardly extending tabs carried thereon and having a front member and having a rear cabinet panel attached to said base frame and a control housing, said method comprising the steps of:

engaging said bottom flange on said vertical front beneath said front member;

rocking said cabinet wrapper toward said rear panel;

aligning and engaging said tabs on said base frame and said apertures in said cabinet wrapper side flanges;

securing said cabinet wrapper to said rear panel and to said base from; and

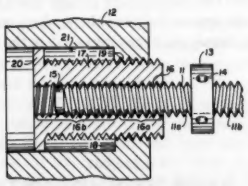
installing said control housing on said cabinet wrapper top.

4,324,036

"METHOD OF MAKING ORTHODONTIC SCREW-TYPE DEVICE"

Frank Reilly, Freeport, N.Y., assignor to Quanta Chemical Ltd., Brooklyn, N.Y.

Division of Ser. No. 45,304, Jun. 4, 1979, Pat. No. 4,231,736.
This application May 21, 1980, Ser. No. 151,798
Int. Cl.³ B23P *11/00*; F16B *39/00*
U.S. Cl. 29—437 **4 Claims**



1. A method of making an orthodontic screw-type biassing device comprising:

internally threading a threaded bore in a first member with first and second threaded portions adjacent each other in the axial direction of said threaded bore, said first and second threaded portions having thread roots which lie substantially on a common line;

forming the crests of the threads of said first and second threaded portions such that the thread depth of the threads of said second portion is less than the thread depth of the threads of said first threaded portion;

forming an externally threaded screw-type member and threadably engaging said member in said internally threaded bore of said first member; and

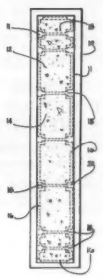
deforming the threads at an end portion of said screw member such that said deformed threads substantially freely, threadably pass through said second portion of said threaded bore and bind and are substantially non-rotatable relative to said first threaded portion of said threaded bore.

4,324,037

STRUCTURAL UNITS AND ARRAYS THEREFROM

Clyde C. Grady, II, 3700 Garth Rd., Apt. 2101, Baytown, Tex. 77521

Filed Aug. 29, 1977, Ser. No. 828,312
Int. Cl.³ B23P *21/00*
U.S. Cl. 29—469 **9 Claims**



1. A method of constructing an array comprising the steps of:

a. providing a plurality of composite structural units, each of said structural units comprising

(i) an inner structural core of cast material;

(ii) a plurality of load-distributing plates integrally attached during casting to said core, each of said plates being substantially hard to resist fracture, and having internal strength sufficient to substantially dissipate point stresses there being provided a plurality of holes through said core and said attached plates, each of said plates providing a mating face for contacting the face of an adjacent attached unit;

(iii) tension means extending through said holes for holding two of said units tightly together in face-to-face relationship forming a structural array;

b. placing a first and a second of said structural units together in a desired array;

c. applying a tensile connector to the first and second units, perfecting a connection;

d. applying a second tensile connector to the second unit;

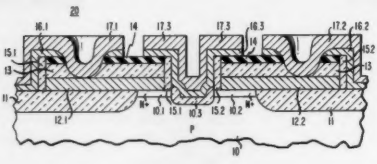
e. placing a third structure unit in face-to-face relationship with the second structural unit; and

f. perfecting a connection between the second and third structural unit using the second tensile connector.

4,324,038
METHOD OF FABRICATING MOS FIELD EFFECT TRANSISTORS

Chuan C. Chang, Berkeley Heights; James A. Cooper, Jr., Warren; Dawon Kahng, Bridgewater Township, Somerset County, and Shyam P. Murarka, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1980, Ser. No. 209,755
Int. Cl.[3] H01L *21/28*
U.S. Cl. 29—571 20 Claims

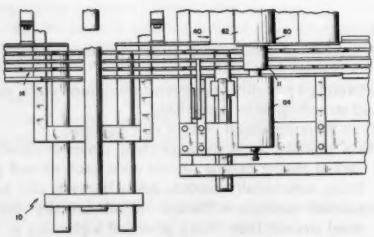


1. A method of fabricating a semiconductor device (20) having a pair of spaced-apart source and drain contact electrodes (12.1, 12.2) contacting spaced-apart surface areas of source and drain regions (10.1, 10.2), respectively, located at a top surface of a semiconductor body (10) and having a gate oxide layer (10.3) grown on a first portion of the said top surface located between said apart areas characterized by the step of forming a sidewall insulating layer (15.1, 15.2) on an exposed mutually opposing sidewall edge surface of each of the contact electrodes (12.1, 12.2), followed by the step of thermally growing the gate oxide layer (10.3).

4,324,039
APPARATUS AND METHOD OF DELIVERING DEPOLARIZATION MIX INTO A DRY CELL CAN

Leonard Schub, Stamford, Conn., assignor to Wonder Corporation of America, Inc., South Norwalk, Conn.

Filed Apr. 22, 1980, Ser. No. 142,666
Int. Cl.[3] H01M *2/36;* B23P *19/04;* B65B *1/24*
U.S. Cl. 29—623.1 10 Claims



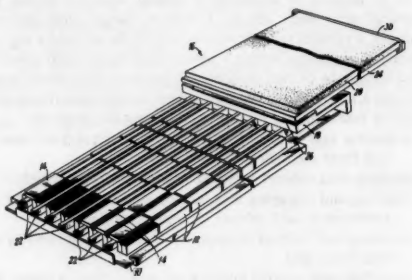
1. A battery assembly apparatus comprising:
(a) means at a first station along an assembly line for delivering depolarizing mix to a dry cell can,
(b) means at a second station downstream from said first station and along said assembly line for inserting a carbon rod into said dry cell can containing depolarizing mix, and
(c) mix washer insertion means at a third station downstream from said second station and along said assembly line for reconsolidating said depolarizing mix during the insertion of a mix washer after said carbon rod has been inserted according to paragraph (b), said mix washer contacting and producing uniform reconsolidation of the mix to the proper density by said mix washer insertion, said mix washer insertion means including compression means for exerting a bias against and for supporting the bottom of the can, while allowing the can to move, as the mix washer is inserted into the can and pushes against the mix.

7. The method of delivering depolarizing mix into a dry cell can comprising the steps of:
(a) delivering a depolarizing mix into a dry cell can;
(b) inserting a carbon rod into the dry cell can containing depolarizing mix; and
(c) inserting a mix washer into the depolarizing mix filled dry cell can and against the depolarizing mix, while exerting a bias against and supporting the bottom of said can while also allowing said can to move as said mix washer is inserted into said can, so that said mix washer contacts, pushes against and uniformly reconsolidates said depolarizing mix to the proper density.

4,324,040
TOOL FOR REMOVING INTEGRATED CIRCUITS FROM A BURN-IN BOARD

John D. Gottlieb, Smithtown, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Jul. 24, 1980, Ser. No. 172,018
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—829 7 Claims



1. A tool for use in removing integrated circuit packages from a burn-in board or the like in which a plurality of sockets are mounted in a plurality of spaced parallel rows for receiving the leads of integrated circuit packages, said tool comprising an end bracket, a plurality of enlongated prongs attached to and extending from said end bracket, said prongs being spaced by an amount corresponding to the distance between adjacent rows of sockets on the burn-in board, a cover pivotally mounted to said end bracket, and means for releasably securing said cover to the free ends of said prongs when said prongs are placed along the spaces between the sockets and the underlying integrated circuit packages mounted in the sockets.

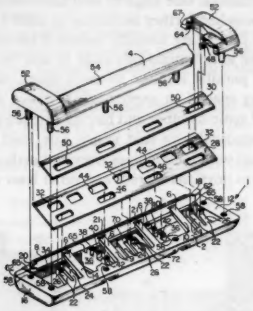
4,324,041
RAZOR BLADE ASSEMBLY

Robert A. Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 7, 1980, Ser. No. 176,138
Int. Cl.[3] B26B *21/22*
U.S. Cl. 30—47 24 Claims

1. A razor blade assembly comprising a cap portion and a base portion, first arm means extending from said base portion and joining a guard portion extending generally parallel to said base portion, second arm means extending from said base portion toward said guard portion, and blade means disposed

on said second arm means, said first and second arm means being leaf spring means permitting movement of said guard



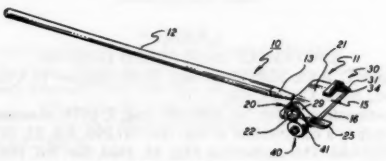
portion and said blade means relative to said base portion and said cap portion during a shaving operation.

4,324,042

SHINGLE STRIPPER

Stanley H. Lipka, and David J. Lipka, both of 133 Cross St., Yorkville, N.Y. 13495

Filed Sep. 22, 1980, Ser. No. 189,084
Int. Cl.³ B26B *3/00*
U.S. Cl. 30—170 **8 Claims**



1. Apparatus for stripping the tabs from the underbody of a shingle that has been nailed to a subsurface including

a blade having a top surface and a bottom surface that are cojoined to form a thin forward edge which is able to pass easily under the tabs of a shingle,

a ripping bar mounted upon the top surface of the blade along one edge thereof, said ripping bar having a ramp section that slopes upwardly from the forward edge of the blade toward the rear edge thereof,

a tab guide having a support flange secured to the top surface of the blade adjacent to the other side edge thereof and a raised finger canterlevered from the flange which extends over the top surface of the blade from the flange toward the ripping bar whereby the tab of a shingle passing over the top surface of the blade is caused to pass under the finger, and

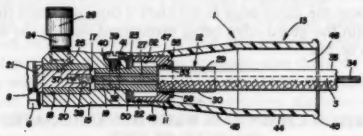
a hold down member secured to the blade and extending outwardly from said one side edge thereof adjacent to the ripping bar, said hold down member further having a working surface that extends downwardly below the bottom surface of the blade to ride over the underbody of the shingle as the ripping bar passes under the tabs whereby the tabs are separated from the underbody of the shingle.

4,324,043

HANDPIECE FOR MEAT-TRIMMING KNIFE

Timothy J. McCullough, Box 295, Lake Rd., Vermilion, Ohio 44089

Filed Oct. 8, 1980, Ser. No. 195,096
Int. Cl.³ A22C *17/00*
U.S. Cl. 30—276 **15 Claims**



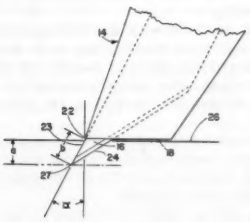
1. An improved handpiece for a meat-trimming knife of the type having an annular blade holder mounted on the handpiece with an annular cutting blade rotatably mounted on said holder, in which gear means is mounted on the handpiece and drivingly engages the cutting blade, in which flexible cable means extends into the handpiece and is operatively engaged with the gear means to drive said gear means and cutting blade, and in which ferrule means mounts the flexible cable means within the handpiece; wherein the improvement includes hollow handle means; a blade holder attachment portion on which the blade holder is adapted to be mounted; coupler means removably mounting the handle means on the blade holder attachment portion, said coupler means being formed with a bore; bearing means provided in the bore of the coupler means for rotatably supporting the ferrule means in said coupler means bore; and sealing means mounted in the bore of the coupler means for sealing engagement with the ferrule means to prevent passage of contaminants along the ferrule means.

4,324,044

SURGICAL KNIFE FOR PRECISE DEPTH OF CUT CONTROL

Lee Shahinian, Jr., 1232 Lisa La., Los Altos, Calif. 94022

Filed Aug. 4, 1980, Ser. No. 174,754
Int. Cl.³ B26B *29/02*
U.S. Cl. 30—294 **4 Claims**



1. A surgical knife for making incisions of a controlled depth in a selected tissue surface comprising:

handle means for controlling the movements of the knife having a tapered end, said tapered end being selectively truncated obliquely to the major axis of the handle means to form a substantially flat guard surface with a rectilinear edge and with a normal vector to said guard surface forming an angle α to the major axis of the handle means; and

a planar blade having a dull edge and a sharpened edge, said blade being affixable substantially perpendicularly to the guard surface to extend outward therefrom with the dull blade edge normally intersecting said rectilinear edge of the guard surface with an obtuse included angle defined by the dull blade edge and the guard surface, the dull blade edge aligned to be substantially parallel to the major axis of the handle means, and the intersection of the dull

and sharpened edges of the blade forming an acute included angle and defining the point of maximum extent from the guard surface with the sharpened blade edge intersecting the guard surface in an acute included angle defined by the sharpened blade edge and the forward portion of that surface with respect to the guard edge, and the portions of said rectilinear edge extending laterally from at least one side of the blade to form a guard edge for limiting the depth of the incision as the knife is pivoted about the guard edge as the knife is drawn toward the user with the guard edge being maintained against the surface to be cut.

4,324,045

MOTOR CHAIN SAW WITH DYNAMIC SAFETY BRAKING DEVICE

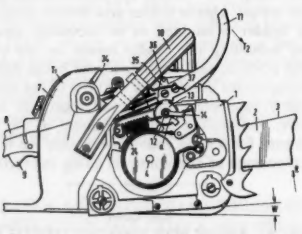
Klaus Höppner, Marbach, and Günter Wolf, Murrhardt, both of Fed. Rep. of Germany, assignors to Firma Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,534

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922574

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—381 **9 Claims**



1. A portable motor chain saw, comprising in combination:
a motor housing including a handle housing portion;
a safety braking device, associated with said motor housing, for protecting against recoil movements;
a handle mounted to said handle housing portion of said motor housing;
a hand guard associated with said braking device for actuating same, said hand guard acting as an inertia mass and being arranged between said handle and the saw chain, said hand guard being pivotally journalled about an axis extending substantially parallel to the drive axis of said saw;
damping elements mounted relative to said motor housing both to damp unavoidable vibrations and for supporting said handle relative thereto for attaining an inertia magnitude by utilization of recoil;
an arresting device rigidly connected to said handle and engaging said hand guard in such a way that it is releasable under the influence of a relative movement due to the inertia magnitude of said motor housing with respect to said handle, caused by a recoil, consequently releasing said hand guard for pivotal movement only upon exceeding a predetermined value of recoil.

4,324,046

PATTERN GRADING DEVICE

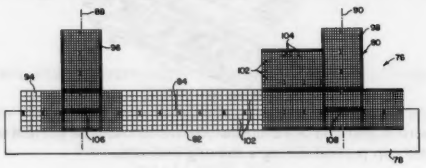
Donald A. Weinberg, 2201 Acacia Park, Lyndhurst, Ohio 44124

Filed Mar. 3, 1980, Ser. No. 126,652

Int. Cl.³ A41H *3/00*

U.S. Cl. 33—17 A **1 Claim**

1. A grading device for grading a master pattern having a predefined outline, comprising: an elongated base member for resting flatwise on a flat work surface and having at least one longitudinal side edge, an elongated scale member secured flatwise to the top surface of said base member in longitudinally parallel overlying relation thereto, said scale member having a longitudinal major axis parallel to and coinciding with the said longitudinal side edge of said base member, said elongated scale member further including at least a pair of lateral arm portions projecting laterally outward relative thereto and to the said one longitudinal side edge of said base member and extending in parallel relation to each other, said lateral arm portions being spaced an appreciable distance apart along the length of said scale member and having respective minor parallel axes perpendicular to said major axis, said scale member being provided with indicia lines disposed orthogonally on the said lateral arm portions thereof and on at least the portions of



said scale member between the said lateral arm portions, said indicia lines respectively extending parallel and perpendicular to the said major axis of said scale member, said grading device further including a guide frame for attachment to a master pattern and resting on the said scale portion of said grading device for sliding adjustment movement relative thereto, said guide frame comprising an elongated base portion having a longitudinal straight side edge and three parallel pattern-holding arms projecting laterally outward from the other longitudinal side edge of said base portion, two of said arms being spaced an appreciable distance apart along the length of said base portion and the third one of said arms being in relatively close spaced relation to one of said two arms.

4,324,047

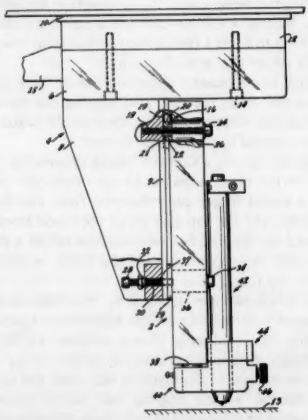
UNIVERSAL HIGH SPEED HOLDER

Jacques L. Roch, Half Moon Bay, Calif., assignor to Xynetics, Inc., Santa Clara, Calif.

Continuation of Ser. No. 931,409, Aug. 7, 1978, abandoned, which is a continuation of Ser. No. 707,893, Jul. 22, 1976, abandoned. This application May 16, 1980, Ser. No. 150,553

Int. Cl.³ B43L *13/00*

U.S. Cl. 33—18 R **35 Claims**



1. An apparatus for making drawings on a working surface

in accordance with the production of individual signals comprising:

a platen,

a forcer disposed relative to said platen for movement relative to the platen,

retaining means adjustably connected to said forcer,

a plurality of separately actuatable means movable relative to said retaining means in accordance with the actuation of the actuatable means,

a plurallity of tools each associated with an individual one of the actuatable means for movement with the actuatable means in accordance with the actuation of the actuatable means and each movable independently of the actuatable means,

said retaining means holding the plurality of separately actuatable means and the plurality of tools for movement of the associated tool into or out of operative relationship with the working surface in accordance with the actuation of the actuatable means,

a plurality of means each adjustable to control the positioning of an individual one of said actuatable means relative to the working surface in accordance with such adjustments to control the degree of contact of said tools with the working surface,

means to position each of said tools independently of the positioning of the associated actuatable means,

means operatively associated with the actuatable means in the plurality and responsive to the production of the individual signals for individually actuating the actuatable means in accordance with the production of such signals to move the actuatable means and bring the associated tools into operative relationship with the working surface, and

means operatively associated with individual tools in the plurality for providing for each such tool a floating relationship between such tool and the working surface independently of the positioning of the associated actuatable means and independently of the operation of the actuating means in actuating the associated actuatable means.

4,324,048

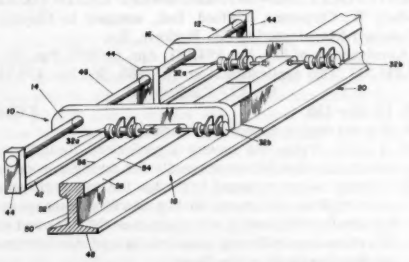
LOCATOR FOR RAIL ALIGNING DEVICE

Ralph S. Frost, Olympia Fields, Ill., assignor to Chemetron Railway Products, Inc., Chicago, Ill.

Filed Jan. 16, 1980, Ser. No. 112,587

Int. Cl.³ B25B *1/10*; B23P *19/00*

U.S. Cl. 33—180 R **3 Claims**



1. In a rail alignment machine of the type having rail locators for correctly positioning normally horizontal rail sections in horizontal and vertical planes respectively to effect end-to-end alignment of the sections, an improved horizontal locator including:

a generally horizontal support bar;

a spaced apart pair of rail contact elements pivotally mounted on said bar for swinging movement about the longitudinal axis thereof;

at least one of said elements also being shiftably supported on the bar for reciprocation along the longitudinal axis thereof;

each of said contact elements comprising:

an elongate arm extending generally perpendicularly of said bar, and having a pivoted end attached to the bar and a free end remote therefrom;

a fixed reference surface formed in said arm adjacent said free end, said reference surface being adapted to engage the running surface of a rail head from above;

a pair of opposed, reciprocable, counteracting side-contact members mounted on said arm for co-operatively clamping said rail head on opposite sides thereof;

said side-contact members being offset from the plane of said reference surface a predetermined distance such that the sides of said rail are contacted by said member only at points remote from said running surface when the latter is contacted by said reference surface.

4,324,049

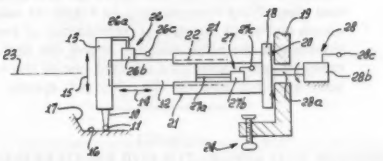
GAGING SYSTEM AND METHOD

Thomas L. Blose, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Nov. 5, 1979, Ser. No. 91,270

Int. Cl.³ G01B *7/28*

U.S. Cl. 33—199 B **43 Claims**



1. In a work gaging system, said work being in the form of a pipe defining work surfaces as a thread extending about an axis, the combination comprising

(a) first means having a gaging tip engageable with said work surfaces,

(b) means supporting said first means, for longitudinal, lateral and rotatable displacements of said tip, and

(c) means to sense said longitudinal, lateral, and rotatable displacements of said tip for readout purposes,

(d) said gaging tip sized to be freely received between successive threads to be bodily displaced axially from a position of engagement with a thread flank facing in one axial direction and into another position of engagement with a thread flank facing on the opposite axial direction,

(e) said (b) means including a first slide movable in a first direction generally parallel to said axis, and a second slide movable in a second direction extending generally radially relative to said first direction, one of said slides carried by the other and movable relative thereto, and a rotor carrying said other slide for bodily rotating it about an axis generally parallel to said first direction, whereby both slides are rotated by the rotor,

(f) and a support for said rotor.

4,324,050

SCALE MAGNIFIER

John R. Weir, 4816 NE. 49th Ave., Vancouver, Wash. 98661

Filed Feb. 11, 1980, Ser. No. 120,705

Int. Cl.³ G02B *27/02*

U.S. Cl. 33—488 **1 Claim**

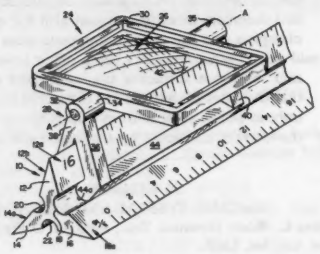
1. A magnifier for facilitating visual perception of scale markings on an engineer's scale having three apexes comprising:

a mount including legs which detachably engage the scale

with portions extending above a first one of the apexes and joining to form a sleeve means;

a magnifying element connected to said mount so that it spans across the first apex, said magnifying element being dimensioned to extend laterally above the viewable scale markings adjacent the other two apexes; and

pivot means interconnecting said mount and said magnifying element by being rotatably accepted in said sleeve



means, said pivot means being disposed above the first apex, when said mount engages the scale and defining a pivot axis which extends generally parallel to the longitudinal axis of the scale and above the first apex so that said magnifying element may be tilted via said sleeve means and pivot means in a selected one of two directions about the pivot axis and above the first apex to enable magnification of a selected one of the viewable scale markings adjacent the other two apexes.

4,324,051

PROCESS AND APPARATUS FOR RECOVERING HEAT FROM FINELY TO COARSELY DIVIDED MATERIAL HAVING HIGH TEMPERATURE

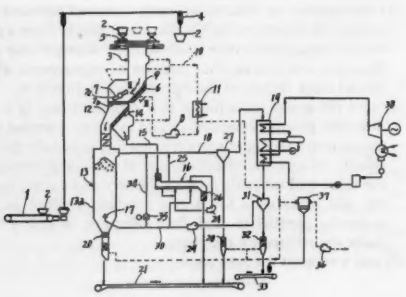
Katsuhiko Sasaki; Masaru Sakaba, both of Nara, and Kingo Hayashi, Takatsuki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jun. 27, 1980, Ser. No. 163,844

Claims priority, application Japan, Jul. 7, 1979, 54-86147

Int. Cl.³ F26B 5/00

U.S. Cl. 34—20 **10 Claims**



1. A process for recovering heat from a finely to coarsely divided material having a high temperature comprising the steps of separating the material into a portion of lumps and a portion of particles, forcibly applying a stream of cooling gas to substantially the entirety of one separated portion of material and forcibly applying a separate stream of cooling gas to substantially the entirety of the other separated portion of material in a manner such that neither stream of cooling gas has been preheated by the other when applied to the respective portion of material, and recovering heat from both streams of cooling gas.

4,324,052

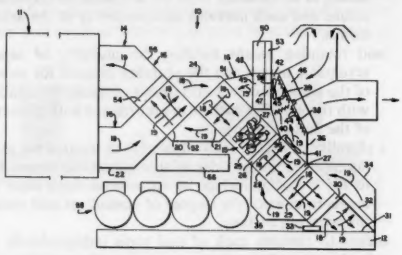
SOLVENT AND HEAT RECOVERY SYSTEM FOR DRYING OVEN

John L. Bosher, 2469 Emory La., NE., Marietta, Ga. 30067

Filed Sep. 5, 1980, Ser. No. 184,288

Int. Cl.³ F26B 3/04

U.S. Cl. 34—27 **8 Claims**



1. A process for recovering solvent and heat from hot solvent saturated air in drying ovens comprising the steps of:

moving the hot air with solvent vapors entrained therein from the drying oven through a plurality of cooling stages of a substantially closed air cycle including in sequence through a first pair of cross-flow heat exchangers, then progressively along a downwardly inclined path from the first pair of cross-flow heat exchangers through an air coil heat exchanger, through a water coil heat exchanger, through a second pair of cross-flow heat exchangers and about a refrigerant fluid evaporator to a demister,

collecting the condensed solvent from the air at the evaporator and the demister at the end of the downwardly inclined path,

moving the cool dry air through a plurality of heat transfer stages including in sequence from the demister back through the second pair of cross-flow heat exchangers, through the first pair of cross-flow heat exchangers, then about a refrigerant fluid condenser to the oven chamber.

4,324,053

ANTI-POLLUTION ROTARY-SWEEP GRAIN DRIER

Rodney W. Carpenter, Milford, Ind., assignor to Clayton & Lambert Manufacturing Co., Buckner, Ky.

Continuation of Ser. No. 894,181, Apr. 6, 1978, Pat. No. 4,241,517. This application Aug. 20, 1980, Ser. No. 179,745

Int. Cl.³ F26B 19/00

U.S. Cl. 34—236 **5 Claims**

1. A grain drying apparatus comprising:

A. a grain drying bin having a perforated floor through which hot air is blown upwardly for drying purposes;

B. a rotary sweep mounted in the bin for sweep movement over the floor, said sweep having distributing means on its lag side for distributing wet grain over the floor and radially-extending retrieving means on its lead side for removing dried grain from the floor;

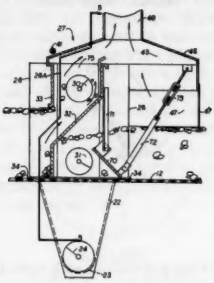
C. means for feeding wet grain to said distributing means;

D. means for receiving dried grain from said retrieving means and conveying said dried grain outside of the bin;

E. a partition wall connected to a central portion of said rotary sweep and extending radially outward therefrom for movement over said floor with the movement of said rotary sweep, said wall extending between said distributing and retrieving means to separate the lag side from the lead side of said sweep; and

F. means for building up the thickness of the dry grain on the

lead side of the retrieving means including a rigid plate at least partially suspended from an upper portion of said wall and disposed in front and on the lead side of said retrieving means, said plate radially extending parallel to said retrieving means between said central portion and a



sidewall of said bin, said plate being inclined with respect to a vertical plane through said bin such that its upper edge is relatively closer to said retrieving means than its lower edge, said lower edge being spaced above said floor to form a horizontally extending gap therebetween.

4,324,054

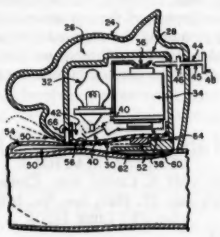
NIGHT LIGHT SLIPPER

William Rovinsky, Old Bethpage, N.Y., assignor to Step-Lite Footwear Inc., New York, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,813

Int. Cl.³ A43B *23/00, 7/02, 3/28;* **G02B** *5/12*

U.S. Cl. 36—137 **12 Claims**



1. In a child's slipper having illumination means associated therewith for lighting a path to be traversed by said child's slipper as the child wearer thereof travels along a walking surface step-by-step, said child's slipper having a front portion, a rear portion and a bottom sole portion, said bottom sole portion being bendable so as to flex with each step taken by said child wearer, said front portion forming a pocket for the front portion of the foot of said child wearer with said flexible bottom sole portion, said illumination means comprising a housing disposable on said front portion, a light source, a battery source for powering said light source upon completion of an electric conduction path therebetween and a switch means for selectively connecting said battery source to said light source in said electrical conduction path, said light source, battery source and switch means being disposable in said housing; the improvement comprising a resilient pusher member mountable in said front portion for direct flexing movement in conjunction with said flexing of said bottom sole portion during each step by said child wearer, said pusher member being disposed adjacent said switch means for actuating said switch means during each flexure of said pusher member so as to close said switch means during each step by said child wearer, and a light transmissive three dimensional hollow recognizable character rendition, said illumination means being disposable in said recognizable character rendition for illuminating said recognizable character rendition each time said light source is illuminated, said recognizable character rendition comprising a child's night light capable of being periodically illuminated with each step by said child, whereby said night light accompanies said child wearer during said path traversal.

4,324,055

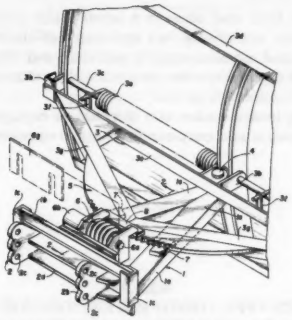
MOLDBOARD SUPPORT ASSEMBLY

John H. Hippensteel, Newville, Pa., and Rupert J. Brady, Bethesda, Md., assignors to Richard P. Valk, Carlisle, Pa.

Filed Jul. 21, 1980, Ser. No. 170,793

Int. Cl.³ E01H *5/04*

U.S. Cl. 37—42 VL **12 Claims**



9. In a moldboard support assembly of the type having a drive frame assembly including a pair of convergent frame members, a blade and moldboard support frame pivotally connected to the convergent ends of the drive frame assembly for pivotal movement about a vertical axis, the blade and moldboard support frame including a pair of convergent frame members having their divergent ends connected to the moldboard, the pivotal movement of the blade and moldboard support frame being effected by a gear segment on the blade and moldboard support frame beingdriven by a motor-driven worm gear mounted on the drive frame assembly, the improvement comprising the gear segment connected to the convergent end portions of the convergent frame members of the moldboard support frame, a pair of wear pads mounted on the upper surface of said convergent frame members of said drive frame assembly and engaging the lower surface of the convergent frame members of said moldboard support frame, a bracket on the drive frame support assembly in which the worm gear is rotatably mounted, another wear pad connected to said bracket and engaging the upper surface of the gear segment to thereby maintain the drive frame assembly and moldboard support frame in alignment to insure proper intermeshing of the worm gear and gear segment, whereby the bracket provides the dual function of supporting the worm gear and said another wear pad which engages the upper surface of the gear segment.

4,324,056

WIPING DEVICE FOR A DITCH DIGGING MACHINE

Gerhard Sommerfeld, Verbindungsweg 1, 2905 Edewecht/Friedrichsfehn, Fed. Rep. of Germany

Filed Jun. 25, 1980, Ser. No. 162,971

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 7918437[U]

Int. Cl.³ E02F *5/08*

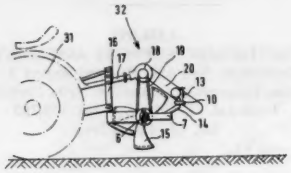
U.S. Cl. 37—94 **4 Claims**

1. A device for removing stones or the like, for use in associ-

ation with a ditch digging machine having at least one digging blade mounted on a generally horizontally-disposed rotatable shaft, comprising:

a wiper endpiece;

bearing means for mounting said wiper endpiece on said shaft, such that it is spaced a relatively short distance



away from said blade in a substantially parallel manner thereto, comprising two opposing half-shells which engage and together encircle said shaft and which are provided on their interior surfaces with continuously adjustable friction linings; and

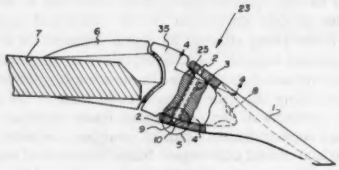
a spring-loaded rocker arm disposed to engage and releasably retain said endpiece in a normal operating position.

4,324,057

PIN TYPE TOOTH RETENTION SYSTEM

Kenneth M. White, 2432 Paliswood Rd. S.W., Calgary, Alberta, Canada (T2V 3P8)

Filed Jun. 11, 1979, Ser. No. 47,292
Claims priority, application Canada, Jun. 21, 1978, 305934
Int. Cl.³ E02F *9/28*
U.S. Cl. 37—142 A **11 Claims**



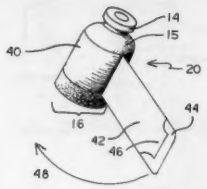
1. An excavator tooth assembly comprising a replaceable tooth having a cutting end and a hollow mounting end, and an adapter having a nose piece which is triangular in longitudinal cross-section mated with the mounting end of said tooth, the mounting end of said tooth being provided with two opposed holes to act in conjunction with a hole extending through the adapter, a resilient insert having a longitudinal hole therethrough to define a first outer surface eccentric to said longitudinal hole, said eccentric outer surface providing a thicker portion which includes compression relief means, orienting means positioning said insert in said hole in said adapter with said thicker portion extending toward the cutting end of the tooth, said orienting means comprising a second outer surface eccentric relative to said first outer surface and said longitudinal hole to provide a protuberance which is fitted into an opening in said nose piece, and a retaining pin extending across the triangle of said nose piece, through said longitudinal hole in said insert, and into the two opposed holes in the mounting end of said tooth to bias said tooth rearwardly along said nose piece.

4,324,058

METHOD OF LABELING UNDERSIZED CONTAINERS

Steven P. Sherwick, Minnetonka; David G. Leapley, St. Louis Park, both of Minn., and James P. Vonderhorst, Parkton, Md., assignors to Accraply, Inc., Minnetonka, Minn.

Filed Feb. 27, 1980, Ser. No. 125,208
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—310 **2 Claims**



1. A method to label a container with more information than the outer circumference of the container may permit, comprising:

(a) attaching a label to the outer circumference of the container, said label having a length, an outer circumference contact portion substantially centered on said label length and being substantially equal to the outer circumference of the container, two overlap portions flanking said outer circumference contact portion and a release portion and a releasable adhesive portion, each flanking one said overlap portion, said contact portion being attached to the outer circumference of the container, all said portions having an exposed surface and an adhesive surface;

(b) attaching said adhesive surfaces of said overlap portions to each other and said adhesive surface of said release portion to a segment of said adhesive surface of said releasable adhesive portion;

(c) wrapping said attached overlap portions around the outer circumference of the container; and

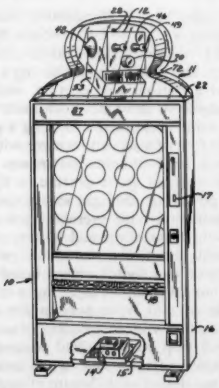
(d) releasably attaching the remainder of said adhesive surface of said releasable adhesive portion to said exposed surface of said outer circumference contact portion.

4,324,059

ATTRACTION AND ENTERTAINMENT DEVICE FOR A VENDING MACHINE

Harold D. Baum, 4615 N. Clifton Ave., Chicago, Ill. 60640

Filed Jun. 27, 1980, Ser. No. 163,783
Int. Cl.³ G09F *19/08*
U.S. Cl. 40—416 **12 Claims**



1. An animated device simulating the head of a figure having

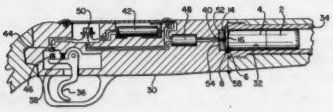
movable eye, ear and jaw elements operable upon actuation of a vending machine, said device comprising, in combination: an upright support secured on said vending machine; a housing in the shape of a head secured for pivotal movement in a horizontal plane on said support; a motor having a rotatable drive shaft secured in and to said housing; drive means mounted in said housing operably connecting said eye, ear and jaw elements to said motor drive shaft for movement therewith, said drive means consisting of a gear secured to said motor drive shaft, a second gear intermeshed therewith, a second drive shaft axially aligned and connected for rotation with said second gear, a bell crank on said second drive shaft, and connections from said second drive shaft and bell crank for moving said eye, ear and jaw elements; linkage mechanism on said support and said motor drive shaft gear cooperating for reciprocally pivoting said housing on said support in a horizontal plane responsive to rotation of said motor drive shaft; and electric means for delivering current to said motor.

4,324,060

FIREARM SYSTEM

George L. Lawrence, 517 W. 160th St., New York, N.Y. 10032

Filed Mar. 17, 1980, Ser. No. 131,271
Int. Cl.³ F41C *19/12*; F42B *5/08*
U.S. Cl. 42—84 **7 Claims**



1. A firearms system comprising a shell having a metal jacket, a rear wall portion of said jacket having a hole centrally thereof, an insulator mounted in said hole, and an electrically conductive contact disposed axially of said insulator and said shell and spaced from said jacket in said hole, a first end of said shell contact being exposed at said rear wall and a second end of said shell contact extending inwardly of said shell and in contact with a reservoir of power; a firearm comprising a housing having a chamber for receiving said shell, a barrel portion extending outwardly therefrom, a trigger mounted on said housing and adapted to be moved by an operator, an electrical circuit mounted in said housing and including a first contact disposed in said chamber, insulator means disposed in said chamber, said insulator means comprising a disc having a concave face portion, said first contact being retained by said insulator disc and being exposed in said face portion, said face portion being adapted to receive said shell insulator and said shell contact for engagement of said first contact and said shell contact, a power source disposed in said housing and in said circuit, second contact means disposed in said circuit and located proximate said trigger, and third contact means disposed in said circuit and movable by said trigger into engagement with said second contact means to close said circuit, whereby to initiate an arc between said shell contact and said metal jacket to ignite said powder.

4,324,061

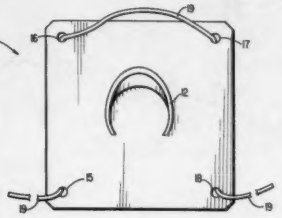
CASTING NET HOLDING DEVICE

Jesse W. Stepp, Rte. 5, Box 1023, Brunswick, Ga. 31520

Filed Jun. 27, 1980, Ser. No. 163,562
Int. Cl.³ A01K *75/00*
U.S. Cl. 43—4.5 **4 Claims**

4. A method of using a casting net holding device when casting with a casting net having a net portion, a hand line and a weight line, said holding device comprises: a plate, means located on said plate for temporarily supporting a portion of the casting net during casting operations, and means for carrying the plate on the caster's body; the method comprising the steps of:

mounting said net holding device on the body of the caster;
coiling a portion of the hand line of said net;
holding said coiled portion of said hand line in one hand;
draping a portion of the weight line of said net over said net supporting means;
supporting a portion of said net in the other hand; and



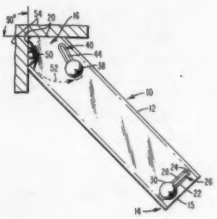
casting said net by swinging it in such a manner that said net spreads out upon the water, the spreading of said net causing said weight line to free itself from said net supporting means without any active intervention on the part of the caster.

4,324,062

HUMANE INSECT TRAP FOR THE LIVE CAPTURE OF SPIDERS AND THE LIKE

Fred A. Schneider, 841 Mohican Way, Redwood City, Calif. 95062

Filed Feb. 19, 1980, Ser. No. 122,033
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—110 **18 Claims**



1. A hand-held trap apparatus for capturing insects alive from given surfaces to allow their subsequent disposal, comprising;

tubular housing means terminating at its ends in preselected flat and pointed geometry configurations for fitting against flat and corner surfaces respectively to totally enclose the insect within the end;

mechanically actuated trap door means including a trap door having integral closure and open actuating means formed of mechanical element means coupled to the trap door, and disposed within the flat and pointed ends to close and open respectively the end of the housing means in response to the mechanical application of respective closing and opening forces; and

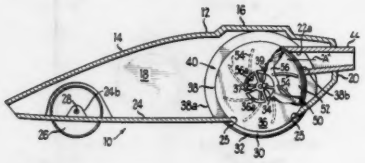
means for maintaining the trap door means in the opened or closed positions;

wherein the captured insect is safely contained within the trap apparatus for subsequent disposal.

4,324,063
TOY MOTOR VEHICLE

Donald A. Rosenwinkel, Tinely Park, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 1, 1980, Ser. No. 192,867
Int. Cl.[3] A63H *17/00, 29/16*
U.S. Cl. 46—44 9 Claims

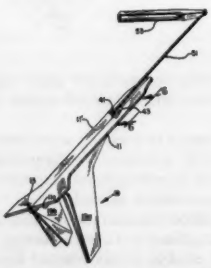


1. A toy motor vehicle having wheel means fore and aft for supporting a body for rolling movement on a playing surface;
said aft wheel means including a wheel mounted for rotation on an axis transverse of said body and having a plurality of generally radial air vanes extending laterally outwardly on opposite sides for causing said wheel to rotate in response to a stream of air applied thereto;
a mouthpiece on an aft end portion of said body having a nozzle outlet in communication with said vanes on opposite sides of said wheel for directing a stream of air against said vanes for rotating said wheel when a person blows into said mouthpiece; and
a wheel housing formed in said body enclosing said wheel on opposite sides of said vanes and having an inlet in communication with said outlet end of said mouthpiece above said axis causing said wheel to rotate in a forward direction, said mouthpiece including an inlet end portion projecting rearwardly outwardly of said aft end of said body, and having opposite sides aligned with opposite sides of said wheel housing, said wheel housing including an outlet opening on an underside of said body.

4,324,064
TOY AIRCRAFT

Pierre A. Bettencourt, and Charles H. Cleveland, both of Bend, Oreg., assignors to North Pacific Products, Inc., Bend, Oreg.

Filed Nov. 13, 1980, Ser. No. 206,364
Int. Cl.[3] A63H *27/14*
U.S. Cl. 46—81 10 Claims

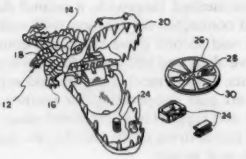


1. A toy aircraft having a fuselage comprising a pair of body halves hingedly connected together for movement from a launching position to a post launching flight position,
each body half carrying an airfoil panel,
and a launching hook on one body half which projects therefrom in the opposite direction from that of said airfoil panels and in an exposed position, when the halves are swung to the launching position.

4,324,065
BALANCE OPERATED GAME

Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,589
Int. Cl.[3] A63H *3/20;* A63F *9/00;* A63H *13/02*
U.S. Cl. 46—120 11 Claims



9. A game device comprising a body in the shape of a simulated animal, simulated upper and lower jaws pivotally mounted on said body for movement between respectively relatively opened and closed positions; a pair of simulated legs having feet and being pivotally mounted in said body for pivotal movement between a first retracted position wherein the feet are adjacent the body and a second extended position wherein the feet may engage a support surface on which the body is placed to hold said jaws above said support surface; spring means for biasing said legs to said retracted position; latch means responsive to pivotally movement of said legs from said retracted to said extended position for pivoting said upper jaw from its closed to its open position and holding it in said open position while latching said legs in said extended position; means normally biasing said lower jaw to its closed position; a plurality of game pieces adapted to be placed in said lower jaw to move said lower jaw towards its open position against the bias of said biasing means; said lower jaw being operatively engaged with said latching means for releasing the latching means when the lower jaw reaches its opened position whereby said legs are returned to their retracted position by said spring means to propel said body forward while said jaws return to their closed positions in a simulated snapping action.

4,324,066
ARTIFICIAL EYE HAVING DOUBLE CONVEX MAGNIFYING LENS

Lori J. Smith, 915 N. Wetherly Dr., West Hollywood, Calif. 90069, and James J. Alser, 5460 White Oak, Encino, Calif. 91316

Filed Apr. 4, 1980, Ser. No. 137,527
Int. Cl.[3] A63H *3/42*
U.S. Cl. 46—165 8 Claims

1. An artificial eye comprising:
(a) a bulbous base having a neck portion and a diametrically opposed crown, the base being comprised of a rigid, substantially unbreakable, opaque, polymeric material;

(b) mounting means extending from the neck portion of the base diametrically opposite the crown;

(c) a double convex, substantially unbreakable, polymeric, magnifying lens mounted on the crown of the base;

(d) an image of the pupil and iris of an eye between the crown and the lens, the image of the pupil and iris being visible through the lens; and

(e) an exterior film of a substantially transparent, substantially unbreakable, polymeric material encasing the lens and the base, the film being at least about 3 mils thick, the lens and the film being comprised of the same polymeric material.

6. A method for forming an artificial eye comprising the steps of:

(a) forming a solid, polymeric, rigid, substantially unbreakable, opaque, bulbous base having a neck portion and a diametrically opposed crown by curing a polymeric resin in a mold;

(b) placing means for mounting the eye into the base in the neck portion diametrically opposite the crown while the polymeric resin is partially cured;

(c) placing an image of the pupil and iris of an eye on the crown;

(d) placing a rigid, substantially transparent, substantially unbreakable, magnifying, double convex lens on the base over the image; and

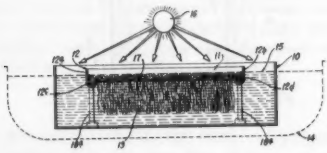
(e) securing the placed lens to the base by encasing the base and the lens in a film comprised of a substantially transparent polymeric material, the film and the lens being formed of the same polymeric material, the film being at least about 3 mils thick.

4,324,067

ALGAL CELL HARVESTING

John O. Kessler, Tucson, Ariz., assignor to The University of Arizona Foundation, Tucson, Ariz.

Filed Feb. 4, 1980, Ser. No. 118,585
Int. Cl.³ A01G *7/00*
U.S. Cl. 47—1.4 **26 Claims**



1. A system for producing accelerated migration of unicellular motile algal cells from a liquid containing reservoir in which said cells are disposed for multiplication by cell division, comprising a cell harvest zone located adjacent the top surface of the liquid in said reservoir, and a mass of discrete elements connecting said harvest zone with the liquid in said reservoir to provide a migration path which enables cells in said liquid to migrate by self-locomotion from the liquid in said reservoir through said mass to said harvest zone.

4,324,068

PRODUCTION OF ALGAE

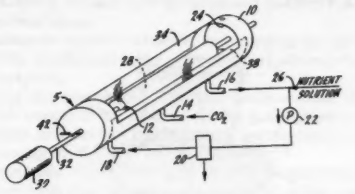
Myron L. Anthony, Grand Junction, Colo., assignor to Sax Zzyxx, Ltd., Clifton, Colo.

Filed Mar. 3, 1980, Ser. No. 126,844
Int. Cl.³ A01G *33/00*
U.S. Cl. 47—1.4 **9 Claims**

1. Apparatus for growing and harvesting algae comprising:

a container for holding a body of water containing an inoculum of algae in suspension and having both a window to admit light for photosynthesis into a space adjacent the body of water and a dark area for dark photosynthesis reaction;

means to introduce carbon dioxide into the body of water to make a solution thereof in the presence of life-supporting chemicals for algae growth and reproduction; a fine mesh



carrier inside the container and supported for cyclically presenting solution fractions containing algae in suspension to the window for photosynthesis and returning the fractions to the body of water;

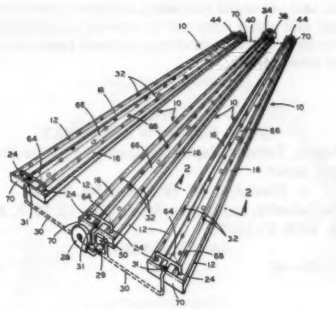
and means to remove the heavier algae from the body of water.

4,324,069

PLANT GROWING SYSTEM UTILIZING PNEUMATIC PRESSURE

Rodger H. Flagg, 1415 Lynn Ave., Fort Wayne, Ind. 46805

Filed May 27, 1980, Ser. No. 153,041
Int. Cl.³ A01G *31/02*
U.S. Cl. 47—62 **16 Claims**



1. An apparatus for periodically supplying liquid to the root system of plants utilizing pneumatic pressure which comprises:

an elongated container for containing a liquid plant nutrient at a first liquid level;

an elongated planar plant support having longitudinal side edges and upper and lower surfaces positioned and supported in said container above said first level;

first means for providing an elongated pneumatic chamber beneath said support and having a lower surface defined by this liquid surface at said first level;

second means for supplying pneumatic pressure within said chamber;

third means for providing a fluid passage from beneath said first level to above said support along substantially the entire length of said support whereby upon application of pneumatic pressure by said second means within said chamber said liquid will be forced downward by said pressure, lowering the liquid level beneath said first level in said chamber, forcing said liquid through said passage to raise the liquid level in said passage to further comprising a above said support;

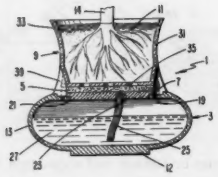
said passage having a longitudinal opening at substantially the level of said support for substantially the entire length of said support.

4,324,070

SELF-WATERING PLANTER

Carolyn L. Swisher, 1100 6th St., SW., Apartment #415, Washington, D.C. 20024

Filed Apr. 24, 1980, Ser. No. 143,493
Int. Cl.[3] A01G 27/00
U.S. Cl. 47—81 7 Claims



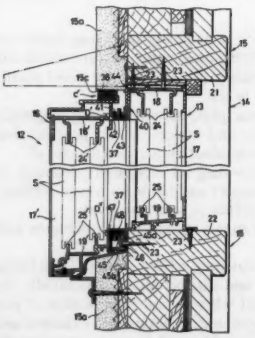
1. A self-watering planter for plants or the like, comprising:
a water reservoir including at least one sealable opening for receiving water therein;
a lid member on said water reservoir;
a wick and absorbent mat disposed atop said lid member of said reservoir, said wick communicating water contained in said reservoir to said absorbent mat; and
a plant container disposed atop said absorbent mat, said plant container including at least one opening formed in a base portion thereof for communicating moisture from said absorbent mat to growing media contained in said plant container,
recess means on said plant container for receiving and enclosing the periphery of said lid member of said reservoir and said absorbent mat when said plant container is seated atop said water reservoir to prevent evaporation of moisture from said absorbent mat and said reservoir directly to the atmosphere.

4,324,071

DUAL WINDOW ASSEMBLY

Kinji Ishida, Toyama, Japan, assignor to Yosnida Kogyo K.K., Tokyo, Japan

Filed Aug. 30, 1979, Ser. No. 71,114
Claims priority, application Japan, Sep. 12, 1978, 53-124990; Oct. 13, 1978, 53-140375
Int. Cl.[3] E06B 7/00
U.S. Cl. 49—63 11 Claims



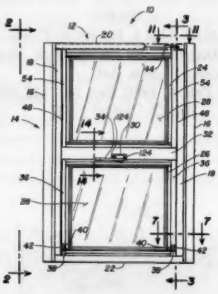
1. A dual window assembly for covering an opening in a building wall having an exterior siding, said dual window assembly comprising in combination:
(a) an interior window unit having a first rectangular unitized metal frame receivable within the opening, and a first pair of sashes mounted within said first frame, said first frame being apertured at its outer periphery for enabling fastening means to project therethrough into the wall, said frame further having a first mounting means composed of vertical flange portions integral with the sides of said first frame at its outer portion for being disposed at the interior side of the exterior siding;
(b) an exterior window unit having a second rectangular unitized metal frame only partially receivable into the wall opening from the exterior, and a second pair of sashes mounted within said second frame, said second frame having a second mounting means composed of first and second flange portions integral with the sides of said second frame at its inner portion and disposed outwardly of said vertical flange portions;
(c) a separate connector plate interconnecting said second frame with said first frame, said connector plate including a pair of first and second sections integral with each other and respectively secured to said first and second mounting means; and
(d) engaging means on said second section of said connector plate extending around an edge of said vertical flange portions of said first mounting means.

4,324,072

INSULATED MULTIPLE COMPONENT SINGLE PLANE BUILDING STRUCTURE PORTAL CLOSURE

Maurice E. Sterner, Jr., Spring Grove, Pa., assignor to Product Design & Development, Inc., York, Pa.

Filed Mar. 31, 1980, Ser. No. 136,060
Int. Cl.[3] E05D 15/20
U.S. Cl. 49—129 12 Claims



1. An insulated multiple component single plane building structure portal closure having a thermal differential building structure interior-to-exterior transversely intermediate conductive and convective barrier structure with a plurality of glazing frames therein provided respectively with a glazing frame hardware assembly each therefor to mechanically enable a manually articulated transverse off-set parallel displacement of one of a glazing frame thereof of said plurality of glazing frames from a closed single plane closure secured disposition within said plurality of glazing frames thereof in turn within a portal encasement frame structure of said portal closure to a respectively parallelly planar slidably open displacement disposition in addition to all of said glazing frames thereof being pivotally tiltable and removable from said portal encasement frame structure, said insulated multiple component single plane building structure portal closure comprising in combination:
a. a transversely parallel set of laterally spaced glazing frame slide jambs integral to said portal encasement frame structure said slide jambs being structurally interconnected one to the other transversely building structure interior-to-exterior intermediate thereof by a thermally non-conductive connecting member and adapted respectively by

means of said glazing frame hardware assembly to articularly receive therein said plurality of glazing frames;

b. a longitudinally spaced set of jamb connecting members joining said transversely parallel set of laterally spaced glazing frame slide jambs at the respective longitudinal ends thereof apart laterally equidistant said jamb connecting members in turn respectively structurally embodying transversely building structure interior-to-exterior intermediate thereof another of said thermally non-conductive connecting member;

c. a lower glazing frame sash assembly provided with a lower glazing frame hardware assembly comprised in combination of a laterally spaced set of elongated channel member components integral to said lower glazing frame sash respectively disposed the lower proximity outwardly either lateral vertical side thereof and projecting building structure interior therefrom to respectively receivably engage cooperatively within a channel opening thereof a slide jamb engaged vertically displaceable channel engagement pivot lug such that said lower glazing frame hardware assembly cooperatively enables transversely displaceable movement parallelly of said lower glazing frame sash from a building structure exterior slide jamb of said portal encasement frame structure to a building structure interior slide jamb thereof;

d. a pivotal lever lock assembled to a laterally disposed apron member of said lower glazing frame sash and adapted by means thereof to lockably secure said lower glazing frame sash to another of said plurality of said glazing frames disposed contiguously next vertically upward thereof when articularly configured in said closed single plane closure secured disposition wherein all of said plurality of said glazing frames are longitudinally disposed within said portal encasement frame structure respectively in an interlocked abuttable head-to-foot contiguously aligned interface junction therebetween; and

e. a closure secured dead air juncture space sealably enclosed the periphery thereabout with an alternating plurality of thermally insulative gasket strips spatially disposed in interposed communication vertically intermediate between said lower glazing frame sash and said another of said plurality of said glazing frames contiguously next vertically upward thereof to thereby substantially prevent thermal differential energy transfer therebetween when the same are configured in the closed single plane closure secured disposition.

4,324,073

PROCESS FOR AUTOMATIC FEED OF STEADY JAWS

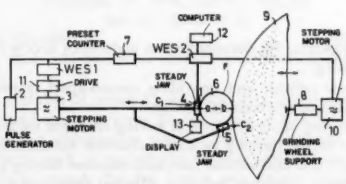
Heinz Belthle, Aichwald, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,680

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856339

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—281 R **3 Claims**



1. A method for the continuous automatic feeding of steady jaws for holding a workpiece, such as a shaft in its axis during machining of the outer face of the workpiece, comprising the steps of

advancing at maximum speed two steady jaws and a grinding wheel, with the grinding wheel diametrally opposite to an upper one of the steady jaws, at a beginning of the machining, transversely to the axis of the workpiece to be machined, toward a pre-programmed distance relative to the workpiece,

reducing the speed of advance, and stopping the advancing of the steady jaws at the predetermined distance from the workpiece,

feeding the steady jaws from this predetermined distance with respect to the grinding wheel, as the grinding wheel stands still, further by a distance corresponding to prestressing on the workpiece,

stopping said steady jaws again to define a rest position,

driving from this rest position both of the steady jaws and the grinding wheel for the machining of the workpiece with a predetermined synchronous feed speed diametrally with respect to each other with an upper one of the steady jaws toward the grinding wheel, toward the workpiece, until a finished machining size is achieved on the workpiece, and

stopping the steady jaws and the grinding wheel and bringing them back to their initial position.

4,324,074

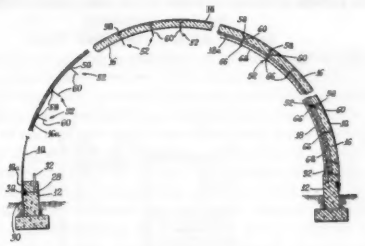
BUILDING STRUCTURE AND METHOD OF MAKING SAME

David B. South, Rte. 3, Box 152, and Barry South, Rte. 3, Box 150, both of Idaho Falls, Id. 83401

Division of Ser. No. 775,097, Mar. 7, 1977, abandoned. This application May 21, 1979, Ser. No. 40,917

Int. Cl.³ E04B *1/34*

U.S. Cl. 52—2 **4 Claims**



1. A building structure comprising a foundation defining a predetermined base configuration for the building, a liquid and gas impermeable inflatable form secured at its lower periphery to said foundation and extending upwardly from said foundation to define an internal chamber, a first layer of insulating foam material secured to the inner surface of said form so as to substantially cover said inner surface of said form, a plurality of hanger members secured to the inner surface of said foam layer, each of said hanger members including a generally planar base portion having an adhesive surface secured against the inner surface of said first foam layer and having a generally cylindrical hanger rod of predetermined length affixed to and projecting from said base portion generally centrally thereto so as to extend upwardly from said base portion in a direction interiorly of said chamber, said base portions each having substantially greater surface area than the transverse cross-sectional area of the corresponding hanger rod, a second layer of insulation foam material of a predetermined depth applied against the inner surface of said first layer so as to embed said base portions of said hangers within said foam material, said hanger rods being of sufficient length to extend outwardly from said second layer of insulation material, a reinforcing mesh secured to and supported by the outwardly extending

portions of said hanger members in spaced relation to said second foam layer, and a layer of cured cementitious material secured to the inner surface of said second foam layer and having said reinforcing mesh embedded therein.

4,324,075

SELF SUPPORTING DAMP-PROOF COURSE

Dirk J. Van Dommelen, and Christopher J. Greenup, both of 3B Park Rd., Alexandria, N.S.W. 2015, Australia

Filed Sep. 11, 1979, Ser. No. 74,439
Int. Cl.[3] E04B *2/00*
U.S. Cl. 52—2 9 Claims

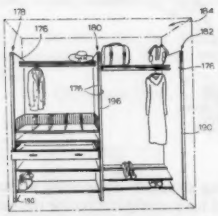
1. A method of inserting a damp-proof course into an existing wall of a building which comprises cutting a slot transversally through the wall along the proposed line of the DPC, inserting an elongate sealable bag or envelope of suitable dimensions into said slot, filling the bag or envelope under pressure with a quick setting waterproof material and allowing said waterproof material to set solid and to support that portion of the wall above the set waterproof material.

4,324,076

WALL UNITS

Reuben Honickman, Ste. 4B, 66 Collier St., Toronto, Ontario, Canada (M4W 1L9)

Continuation-in-part of Ser. No. 903,322, May 5, 1978, Pat. No. 4,186,666. This application Jun. 6, 1979, Ser. No. 46,145
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.[3] A47B *41/04;* E04F *19/00*
U.S. Cl. 52—27 2 Claims



1. A closet structure installed in a building having an alcove defined by first and second side walls and a back wall of said building, said walls being disposed generally vertically with said side walls in generally parallel positions, and said back wall extending between said side walls generally normal thereto,

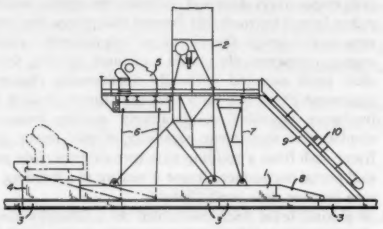
wherein the improvement comprises a wall unit disposed on each of said first and second side walls, said back wall remaining exposed between the wall units, and each wall unit comprising: a relatively rigid, self-supporting panel having an inner surface and a generally flat outer surface said panel being formed with an array of openings which cover substantially the whole of said outer surface, said openings being arranged in a plurality of vertical rows spaced equally across the surface with the openings in each row equally spaced from one another and in horizontal alignment with corresponding openings in adjacent rows, said openings extending through said panel to the inner surface thereof; and means coupling each said panel to the relevant one of said side walls with the outer surface of the panel generally vertical and the inner surface spaced from the wall; and wherein a plurality of article supporting elements are engaged in said openings and are adapted to support articles of clothing and the like.

4,324,077

METHOD OF MOVING A DRILLING RIG LONG AND SHORT DISTANCES

Joseph R. Woolslayer, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed Oct. 26, 1979, Ser. No. 88,555
Int. Cl.[3] E21B *7/02;* E04B *1/34;* E04N *1/12*
U.S. Cl. 52—143 7 Claims



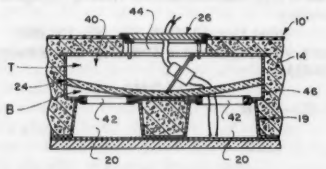
5. Well drilling apparatus comprising a drilling rig provided with a base, skid frames supporting the base at a drilling site and detachably connected to its bottom, wheels at the opposite ends of the base, means detachably connecting the wheels to the base, power means connecting said base and wheel-connecting means for raising the base and frames relative to said wheels to lift the rig and permit it to be moved over the ground and then lowered to the ground at a new drilling location, means for connecting additional skid frames at the ends of the base to the frames beneath the base to form a line of frames, and means for skidding the rig along said line of frames after said base has been disconnected from said underlying frames.

4,324,078

FIRE-RESISTANT FLOOR STRUCTURE

Charles R. Gray, Coraopolis, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Mar. 19, 1980, Ser. No. 131,829
Int. Cl.[3] H02G *3/08;* E04F *17/08*
U.S. Cl. 52—221 10 Claims



1. Apparatus for fireproofing an underfloor access chamber comprising:

a metal cellular unit providing spaced-apart raceways for distributing electrical wiring;

a covering layer of concrete having an upper surface;

insert means forming an access chamber between said concrete and said cellular unit, said chamber having a bottom portion extending between adjacent raceways with inlet openings each communicating with one of said adjacent raceways, and having a top portion with an outlet opening providing access to said chamber from said upper surface;

an unobtrusive resilient strip of fire-resistant material covering all of said bottom portion and obstructing said inlet openings; and

slit means in said resilient strip for passing wiring between each raceway and said chamber without significantly deteriorating the obstruction of said inlet openings;

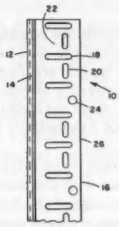
whereby under fire conditions, said resilient strip shields said top portion from convection currents of hot gases which would normally pass through said inlet openings and from high temperature radiation emitted by hot surfaces of said bottom portion.

4,324,079

CORNERBEAD AND CORNER CLIP

Robert J. Pearson, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Aug. 15, 1979, Ser. No. 66,625
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—255 **3 Claims**



1. A cornerbead comprising an elongate straight formed sheet of metal adapted to be easily cut into a plurality of sheet metal clips, said cornerbead consisting essentially of a bead section and two opposed flat flanges disposed at about an 80° angle therebetween, at least one of said flanges having a plurality of substantially uniformly repetitive openings, said openings including a plurality of elongate slots adapted for simplifying the making of preplanned cuts for converting portions of said cornerbead into short corner clips, said slots including a repetitive pattern of laterally extending slots, said laterally extending slots being spaced outward from said bead section and inward from the outer edge of said flange, said outer edge being uninterrupted throughout the length of said corner bead, wherein said elongate slots also include a repetitive pattern of longitudinally extending slots disposed between at least some of said laterally extending slots.

4,324,080

THERMALLY INSULATIVE CEMENTITIOUS BLOCK MODULES AND METHOD OF MAKING SAME

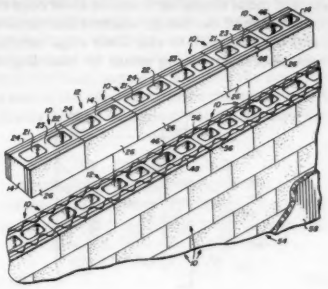
Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Filed Dec. 17, 1979, Ser. No. 104,313
Int. Cl.³ E04D *2/00*
U.S. Cl. 52—309.12 **16 Claims**

1. A thermally insulative cementitious block module comprising:

(a) a plurality of cementitious blocks arranged in an aligned desired modular array so that each of said blocks is in abutting engagement with at least another one of said blocks, each of said blocks defining at least one passage which extends the full length and height thereof, said passages of said plurality of blocks being in alignment with each other; and

(b) a polyurethane foam panel cast and cured in situ within said aligned passages of said plurality of blocks to provide said modular array with a one piece uninterrupted coextensive thermally insulative barrier which fusingly bonds said plurality of blocks into said modular array.

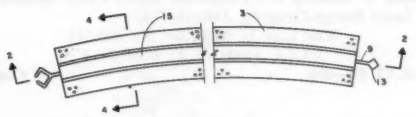


4,324,081

WALL CONSTRUCTION

George Chicha, S. 2225 Inland Empire Way, Spokane, Wash. 99204

Filed Oct. 29, 1979, Ser. No. 89,018
Int. Cl.³ E04B *1/41, 1/54, 1/60*
U.S. Cl. 52—432 **10 Claims**



1. A wall comprising a plurality of concrete slabs, joined together in successive courses, each of said slabs comprising a plurality of vertically spaced horizontally extending reinforcing members and a vertically extending connecting member at each end of each of said slabs, said connecting members being welded to said reinforcing members and extending the entire distance from top to bottom of each of said slabs, said connecting members having interlocking portions positioned completely outside the concrete of said slabs, extending the full length of said connecting members and being straight and uniform in cross section throughout their length, the connecting members of adjacent slabs in the same course being interlocked, the connecting members of slabs in successive courses being aligned and in direct contact with each other and welded together, whereby said connecting members and said reinforcing members form a complete skeleton for said wall, the spaces between said slabs and said interlocking members being filled with non-shrink grout.

4,324,082

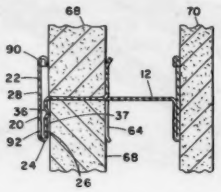
METAL STUD

Edward J. Rutkowski, Kenmore; Carl R. Mapes, Clarence; Steven D. Wing, Getzville, and Jack A. Dawdy, Kenmore, all of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Nov. 8, 1979, Ser. No. 92,587
Int. Cl.³ E04C *3/07*
U.S. Cl. 52—481 **10 Claims**

1. A fire-resistant metal stud for supporting a vertical wall comprising an elongate formed sheet metal body having an elongate first side and, opposite thereto, an elongate second side, elongate means central thereof adjoining said first side and said second side, means on said second side for affixing wallboard thereto, a pair of flanges on said first side adapted to have the edges of a pair of wallboards affixed against the inner

side thereof, whereby said flanges would be disposed on the surface of a wall formed by said wallboards, said pair of flanges including at least one flange which is formed from an inner layer sheet of metal extending from the inner edge of the flange to the outer edge of the flange whereat the metal is reversely folded and extends back to said inner edge forming an outer layer, said inner layer having means for retarding the increase



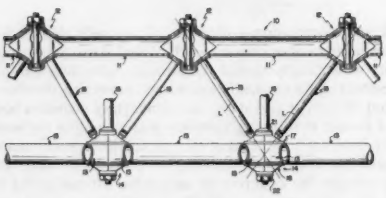
in temperature of said inner layer and the wallboard surface adjacent thereto when said wall is subjected to a fire on the wall second side, said means for retarding comprising structure which directs cooler gases to the interface of said inner layer and said wallboard, said stud further comprising an internal gap formed between said flange inner layer and outer layer, whereby air within said internal gap that becomes heated will tend to move vertically upward, within said gap.

4,324,083

SPACE FRAME

Alfred L. Johnson, Jr., Manhattan Beach, Calif., assignor to LaJet Energy Company, Abilene, Tex.

Filed May 29, 1980, Ser. No. 154,141
Int. Cl.³ E04H *12/00*; E04B *5/14*
U.S. Cl. 52—650 **13 Claims**



1. A space frame comprising:

a first set of beams;

a first set of joints interconnecting said first set of beams in a rigid lattice;

a second set of beams;

a second set of joints interconnecting said second set of beams in a rigid lattice; and

a plurality of tubular struts interconnecting said first and second sets of joints to form a two layered rigid structure;

each of said joints comprising first and second caps receiving a plurality of beams therebetween, one of said caps having a plurality of apertures therein,

each of said tubular struts having first and second substantially cylindrical, non-threaded shafts coupled at opposite ends and extending along the longitudinal axis of each of said tubular struts,

the first shaft coupled to each strut being received in an aperture in a cap in said first set of joints,

the second shaft coupled to each strut being received in an aperture in a cap in said second set of joints,

each of said shafts having fastening means, coupled thereto and engaging a beam for maintaining the shaft in the associated aperture,

each of said caps having a tapering, annular wall, the inner surface of which engages the ends of the beams received therebetween,

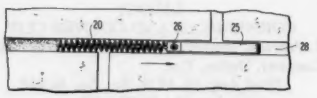
each of said apertures for receiving said shafts being located in said tapering, annular wall.

4,324,084

METHOD OF APPLYING CEMENTITIOUS MATERIAL TO A MORTAR JOINT

Roy A. Walter, 1701 W. Spring St., Lima, Ohio 45805

Filed Jan. 25, 1980, Ser. No. 115,330
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—744 **1 Claim**



1. A method of applying a liquid cementitious coating material to a mortar joint between two bricks, said method comprising the steps of:

loading a liquid cementitious coating material onto an elongated tubular brush of the type having an elongated axial rod along whose length are fixed brush bristles which extend radially outwardly at equal distrances through at least part of an arc from the longitudinal axis of the rod to form at least part of a cylindrical brush surface to contact a mortar joint;

placing the loaded brush in the mortar joint so that the brush surface is in contact with the mortar joint and so that the longitudinal dimension of the brush is aligned with the longitudinal dimension of the mortar joint; and

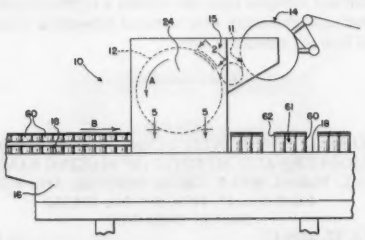
drawing the brush in a straight line along the longitudinal dimension of the mortar joint so that the coating material is evenly deposited in the joint in the form of a strip of constant width.

4,324,085

CARRIER ASSEMBLY APPARATUS

Robert C. Olsen, Streamwood, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 14, 1980, Ser. No. 140,068
Int. Cl.³ B65B *27/04, 21/00*
U.S. Cl. 53—48 **4 Claims**



1. In an apparatus for assembling a plurality of containers into packages by utilizing carrier stock of resilient plastic material comprising a longitudinally extending series of transversely arranged ranks of container encircling bands which are adapted to be transversely stretched for application to successive ranks of a plurality of rows of said containers, a rotating drum assembly for receiving the carrier stock, laterally stretching and applying said carrier stock to said containers, the drum assembly comprising a pair of spider wheels mounted in parallel spaced apart relationship for rotation about a horizontal axis

above the plurality of rows of containers, a plurality of jaw stations mounted in parallel, side-by-side relationship circumferentially about the drum assembly, each jaw station including a pair of opposing carrier stretching and band forming jaws, the improvement comprising each jaw including laterally inner and outer sections, each inner section including a pair of spaced upstanding finger means for association with the inner periphery of each laterally outermost band in the series of container encircling bands to stretch the stock laterally, and each outer section including a ramp means extending upwardly and outwardly from the base of the finger means, the ramp means located directly adjacent and laterally opposing the space between the fingers, the topmost regions of the inner and outer sections being spaced a predetermined, limited distance so as to twist the outermost band as it becomes associated with each jaw between said inner and outer sections, the apparatus further including carrier stock guide means located above one segment of the periphery of the rotating drum adjacent and substantially immediately following the portion of the drum which initially receives the carrier stock, the guide means including a pair of laterally spaced bars of limited thickness, the bars arranged so as to be aligned with the pair of opposing carrier stretching and band forming jaws with each bar located so its thickness dimension is totally confined within the predetermined limited distance defined by the topmost regions of the inner and outer sections, the guide means further arranged to vary in spacing between the lower edge of the bar and the jaws with an entering region being spaced slightly upwardly from the topmost regions of the jaws to an exiting region wherein the lower edge of the bar is spaced downwardly from the topmost regions and within the recess formed between the inner and outer sections so that the outermost band is twisted generally 90° from its original condition.

4,324,086

WRAPPER CLOSED WITH A U-SHAPED CLIP AND PROCESS AND APPARATUS FOR ATTACHING A HANGER LOOP TO THE WRAPPER SECTION

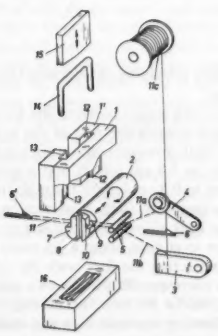
Herbert Niedecker, am Ellerhang 6, 6240 Konigstein 2, Fed. Rep. of Germany

Division of Ser. No. 13,649, Feb. 21, 1979, Pat. No. 4,255,833, which is a division of Ser. No. 866,969, Jan. 4, 1978, Pat. No. 4,165,593. This application Jun. 13, 1980, Ser. No. 159,410

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700641

Int. Cl.³ B65B *61/14*

U.S. Cl. 53—134 **4 Claims**



1. An apparatus for attaching a thread hanger loop to a gathered mouth of a tubular wrapper and for closing the mouth with a U-shaped clip, comprising a punch, a clip guide having opposite grooves for guiding the clip legs, a die for receiving each clip and for cooperating with the punch to close the clip around the gathered mouth end of the wrapper, a thread-withdrawing device disposed beside the clip feed path, a thread snubber and a looping hook and means to move said hook to form a loop in the thread so that both side portions of the loop extend into the path of the clip in the clip guide, a winding head which is axially displaceable into the feed path for the clip and provided with means for engaging both sides of a thread after being snubbed and looped, and means for rotating the winding head so as to form an eyelet in the thread independent of the loop, means to advance the punch and the clip causing one of the clip legs to enter the eyelet and the clip thereafter closing around said mouth of the tubular wrapper.

4,324,087

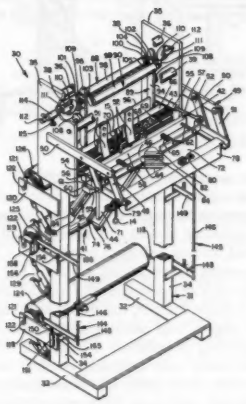
GARMENT BAGGING SYSTEM

William O. Mitchell, and Gordon H. Ellington, both of Vidalia, Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Filed Mar. 28, 1980, Ser. No. 135,104

Int. Cl.³ B65B *25/20*

U.S. Cl. 53—241 **11 Claims**



1. Apparatus for forming a bag about a garment or the like comprising a support frame, a pair of spaced apart, parallel horizontal support rods supported at their ends by said support frame, a garment support assembly comprising a bag opening frame, a pair of spaced apart, parallel support rollers rotatably supported at their ends by said bag opening frame, said support rollers together being of an effective combined width less than the space between said support rods, means for biasing said support rollers apart whereby the support rollers can support themselves and said garment support assembly on said support rods with the bag opening frame suspended down between said support rods and the garment support assembly can be pulled downwardly away from the support rods by forcing the support rollers toward each other, a garment support rod connected at one of its ends to said bag opening frame and normally extending downwardly from said bag opening frame when said bag opening frame is supported between said support rods, and bag material cutting and sealing means positioned below said bag opening frame at the level of said garment support rod, said bag material cutting and sealing means including means for cutting through the bag material and sealing the bag material from positions adjacent and extending away from opposite sides of said support rod, whereby a garment or the like is hung from the lower end of said garment support rod, tubular bag material is fed from a supply along its length downwardly between said support rods and about said garment support assembly and about the garment hung on the garment support rod, and the bag material cutting and sealing means seals the bag material together above the lower end portion of the garment rod and cuts across the bag material above the seal of the bag material.

4,324,088

REFUSE STORAGE APPARATUS WITH SEALER FOR SEALING PLIABLE BAG TOP

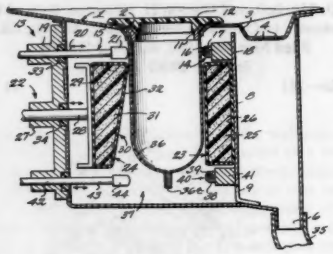
Kiyoshi Yamashita, Aichi, and Shoji Takagi, Toyoake, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 5, 1979, Ser. No. 100,379

Claims priority, application Japan, Dec. 22, 1978, 53-162992; Dec. 22, 1978, 53-81473[U]; Jan. 11, 1979, 54-2291[U]; Jan. 18, 1979, 54-5730[U]

Int. Cl.³ B65B 3/00, 61/24

U.S. Cl. 53—527 1 Claim



1. Refuse storage apparatus comprising:

a sink having an opening and an indented portion adjacent said opening having a plurality of drain holes therein;

a frame mounted to said sink beneath said opening and said indented portion to form a recess with a first section under said opening for receiving a pliable bag having a top and bottom with an opening at the top thereof and a drain hole at the bottom thereof, the top of said bag being supported by the edge of said opening so that refuse passing through said opening is received within said bag, and a second section under said indented portion having an opening adapted for connection to a drain hose so that liquid passing through said drain holes passes through said opening in said second section, said frame having a plate between said two sections with a perforation in the bottom thereof and the bottom of said frame being inclined so that liquid flows through said perforation to said opening in said second section;

first electric heater means mounted on said frame adjacent an upper portion of said bag and first movable pressing means for pressing said upper portion into contact with said first heater means for sealing said upper portion of said bag;

a trapezoidal-shaped flexible block mounted on said frame adjacent said bag for movement toward and away from said bag and for compacting refuse in said bag when movably advanced against said bag and pushing said refuse toward said bottom portion; and

second electric heating means mounted on said frame adjacent said bottom portion of said bag and second movable pressing means for pressing said lower portion into contact with said second heater means for sealing said drain hole.

4,324,089

HORSE CONTROL LEADER

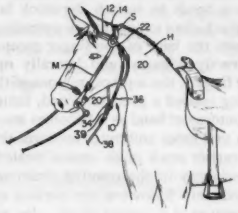
Lena M. Hart; Ronald J. Hart, and Guy D. Hart, All of 7712 Saulsbury St., Arvada, Colo. 80003

Filed Dec. 26, 1979, Ser. No. 106,557

Int. Cl.³ B68B 1/02

U.S. Cl. 54—24 7 Claims

1. A horse control leader for horses adapted for applying uniform pressure to a portion of a horse's head immediately behind its ears, comprising a rigging including a browband having a pair of opposed ends dimensioned to be positioned on the horse with said opposed ends each being immediately beneath the ears of the horse on opposite sides of the horse's head, a crown member having opposite ends respectively connected to said opposed ends of the browband and adapted to extend over the top of the horse's head immediately behind the horse's ears, and an elongated flexible leader having oppo-



site ends connected to said opposed ends of the browband, said leader member sized to form a free-hanging loop having a lower portion in spaced-apart relation to the throat of the horse whereby force applied downwardly on said loop directly causes uniform tension in said crown member to apply said uniform pressure, said crown member having a substantially non-deformable cross-section and flexible along its length.

4,324,090

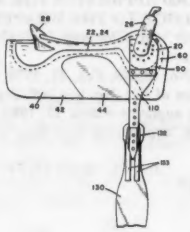
SADDLE

Richard J. Nix, P.O. Box 316, Quakertown, N.J. 08868

Filed Nov. 26, 1979, Ser. No. 97,332

Int. Cl.³ B68C 1/02

U.S. Cl. 54—44 7 Claims



1. A horse saddle providing close contact between horse and rider comprising:

a tree having a fork located toward the front of the horse; a cantle located toward the rear of the horse; two narrow side bars of oval cross-section having a major axis of about from 4.2 cm to 5.8 cm length and a minor axis of from about 0.5 cm to 0.8 cm length through the area of the leg line and starting with such cross-section about at most 8 cm from the back side of the fork and reaching with such cross-section to at most about 4 cm away from the cantle, said bars connecting the fork with the cantle;

padding areas corresponding to the two side bars of the tree and located below the tree and having relatively narrow sections following the side bars and ending in front and rear lobes, said front lobes extending in an outward direction about vertical to the longitudinal direction of the tree bars at about the fork and said rear lobes extending in a rearward direction about parallel to the direction of the side bars at about below the cantle; and

a skirt attached to the bottom of the tree, the skirt being cut out in an area bordered by part of the circumference of the skirt and by three sides with a first side located at about 1 cm to 5 cm away from the outside vertical projection of

the side bars and extending about parallel to the side bars from about the middle of the fork and running to about the end of the narrow section of the side bar, a second section beginning at the end of the first side near the middle of the fork and running outwardly in a direction between about vertical to the first side and to forming an angle of about 30° with the front direction of the side bars, a third side beginning at the other end of the first side at the rear end of the side bar and running outwardly in a direction between about vertical to the first side and a direction forming an angle of about 45° with the front direction of the side bars, said three sides forming together part of the circumference of a trapezoidal to oval area.

4,324,091
VEHICULAR FORAGE HARVESTER

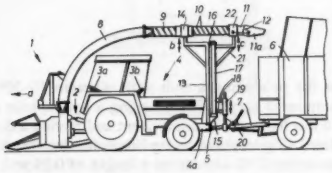
Eberhard Wistuba, Rettenbach; Xaver Lenzer, Kleinkötz, and Herbert Mändle, Kleinanhausen, all of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne Maschinenfabrik and Eisengiesserei GmbH & Co., Günzburg, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,238

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756539

Int. Cl.³ A01D *43/06, 87/10*

U.S. Cl. 56—16.6 **7 Claims**



1. An agricultural vehicular assembly comprising: a forage harvester including means for cutting an agricultural crop; vehicle means having said forage harvester operably mounted therewith; wagon means for receiving said crop from said forage harvester; hitching means pivotally connecting said wagon means with said vehicle means in driving relationship therewith; chute means delivering said crop from said harvester, said chute means including a discharge end for depositing said crop into said wagon means; a flexible chute section connected as part of said chute means; and swivel means having said flexible chute section mounted thereon to effect bending of said flexible chute section in response to pivotal motion between said vehicle means and said wagon means to maintain said discharge end of said chute means directed into said wagon means when said wagon means and said vehicle means turn relative to each other; said flexible chute section including a first and a second end, with said first end being fixed relative to said vehicle means and with said second end being fixed relative to said wagon means, said swivel means and said hitching means being operably associated to effect bending of said flexible chute section simultaneously with relative pivotal motion between said wagon means and said vehicle means.

4,324,092
CUTTERBAR WEAR STRIP

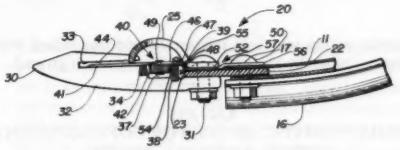
Lawrence M. Halls, New Holland, and Irwin D. McIlwain, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 3, 1980, Ser. No. 203,173

Int. Cl.³ A01D *55/02*

U.S. Cl. 56—298 **12 Claims**

1. In a reciprocating cutterbar assembly forwardly disposed on a mobile crop harvesting machine for the severing of crop material from the ground to initiate the crop harvesting process, said cutterbar being mounted to a harvesting machine frame member, said cutterbar assembly having an elongated support bar affixed to said frame member and disposed transverse to the forward direction of travel of said crop harvesting machine, said support bar having a forward edge spaced forwardly from said frame member; a plurality of knife guards detachably affixed to said support bar and projecting forwardly therefrom, each said knife guard having a ledger surface, a transversely extending vertical support ridge rearwardly of said ledger surface and a transverse trough positioned between said ledger surface and said support ridge, said support ridge having an upper surface in substantially the same plane as said ledger surface; an elongated knife back operatively positioned within said transverse trough for reciprocatory motion therewithin generally parallel to said support bar; and a plurality of generally triangularly shaped knife elements affixed to said knife back, each said knife element having a rearward portion projecting rearwardly of said knife back and a forward portion having forwardly converging cutting edges extending forwardly of said knife back, said knife element being supported on said ledger surfaces and said upper surfaces



of said support ridges such that said knife elements shearingly cooperate with said ledger surfaces to sever standing crop material, the improvement comprising:

a wear strip detachably affixed to said support bar and forwardly projecting therefrom, said wear strip terminating above said support ridge on each said knife guard so as to hold said rearward portion of said knife elements downwardly against said upper surface of said support ridges during reciprocation of said knife back and said knife elements affixed thereto, said wear strip including a first generally planar portion, a second elevated portion integrally joined with said first planar portion and extending upwardly and forwardly therefrom and a third portion rearward of, and elevated above, said first portion, said third portion sloping forwardly downwardly and being integrally joined with said first portion, said first portion forming a depression between said second portion and said third portion to catch severed crop material and prevent same from passing forwardly over the cutterbar assembly.

4,324,093
DEVICE FOR DISPLACING CROP LYING ON THE GROUND

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Mar. 26, 1980, Ser. No. 134,174

Claims priority, application Netherlands, Mar. 30, 1979, 7902483

Int. Cl.³ A01D *77/06*

U.S. Cl. 56—377 **29 Claims**

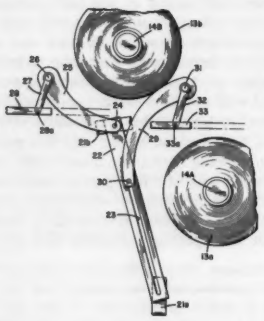
1. A device for displacing crop lying on the ground comprising a frame and a plurality of rotatable rake wheels supported on the frame by crank means that allows upward and downward movements of the wheels, said wheels being positioned to rotate and contact the ground, at least one of said wheels comprising bearing means that surrounds an enlarged center hole and said bearing means being interconnected to the frame by said crank means, said frame including a portion that ex-

tends through the hole with substantial clearance to interconnect with the remainder of said frame, said portion being displaceable within said hole relative to said one wheel during operation, whereby the latter can follow uneven ground.

4,324,094
SEMIAUTOMATIC DEVICE FOR DOFFING SPOOLS FROM A SPINDLE BENCH

Aurelio Cicerone, Ronco Scrivia, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Jul. 9, 1980, Ser. No. 166,990
Claims priority, application Italy, Jul. 19, 1979, 68499 A/79
Int. Cl.[3] D01H *9/04*
U.S. Cl. 57—267 4 Claims

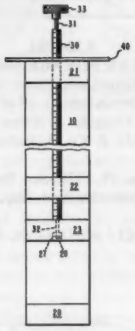


1. Device for the semiautomatic doffing of at least one row of spools on cops provided with mushroom-shaped upper ends on a spindle bench in spinning with immovable closed or open flyers, comprising a horizontal bench upper plate; a plurality of vertical pins rotatingly traversing said plate; an arm having a free end fixed to each of said pins; said arms performing alternate angular movements in the horizontal plane with predetermined amplitude; an immovable and open grip positioned on the free end of each of said arms capable of penetrating into a volume of revolution of a corresponding flyer at the arrest of said spindle and coactable with the corresponding mushroom-shaped upper end of the cop following its rise to a predetermined height; a lever fixed to each pin; a rod pivotally connected to said levers to supply an alternating angular movement to said levers; and means to lower the cops until there is a complete withdrawal of the spindles from the cops, and the aforesaid arms are rotatable in an opposite direction with respect to the previous rotation into the flyer's volume of revolution so as to take the spools out of the relative flyers, and to conveniently accessibly position them ready for being removed.

4,324,095
PROCESS FOR PREPARING SLUB YARNS

Arthur Lulay, Wilmington, Del., and Charles E. Lynch, Camden, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 11, 1978, Ser. No. 868,488
Int. Cl.[3] D02G *3/00, 3/34*
U.S. Cl. 57—327 11 Claims

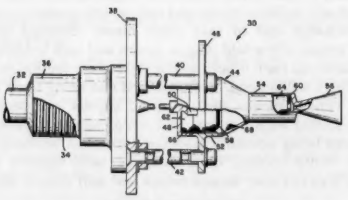


1. Process for producing a slub yarn wherein 10–50% by weight bicomponent acrylic fibers having a hydrophilic component and a less hydrophilic component and having a density of about 1.0 to 1.17 g/cm^3 and an equilibrium crimp reversibility of at least about 20% and cut to a length of 0.25 to 1 inch are blended with staple fibers in an amount of 50–90% by weight during or before carding and processed by conventional procedures into a slub containing spun yarn.

4,324,096
HYDRAZINE THRUSTER

M. Edmund Ellion, Arcadia, Calif., assignor to Hughes Aircraft Company

Filed Apr. 23, 1979, Ser. No. 32,074
Int. Cl.[3] F02K *1/40, 7/02*
U.S. Cl. 60—200 R 10 Claims



1. A hydrazine thruster for pulse mode operation comprising:

thrust chamber means for containing a hydrazine dissociation catalyst and having a centerline;

hydrazine injector means for injecting liquid hydrazine into said thrust chamber means substantially only along said centerline and directly into said catalyst in a plurality of successive pulses, said injector means and said thrust chamber means for containing a hydrazine dissociation catalyst being arranged so that during repetitive pulsing insufficient residual hydrazine is stored in the catalyst bed so that hydrazine bed temperature does not decrease from

the temperature at the initiation of one pulse to the temperature at the initiation of the next pulse;

means for supplying pulses of liquid hydrazine to said hydrazine injector means; and

an outlet from said thrust chamber from which hot gases exit said thrust chamber to produce thrust, there being sufficient hydrazine injected into said thrust chamber means by said hydrazine injector means so that for each pulse the impulse bit, which is the summation of the product of thrust times time, is at least 0.0045 pound seconds.

4,324,097

NON-RETURN VALVE

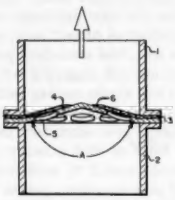
Wilhelm Schmitt, Heppenheim, and Toyotake Taniguchi, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 6,325, Jan. 24, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,391

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1978, 2803778

Int. Cl.[3] **F16K** *15/14*

U.S. Cl. 60—293 **6 Claims**



1. In a combustion and exhaust system of an internal combustion engine, an exhaust manifold for combustion gases and means for supplying fresh air to the exhaust manifold so as to detoxify the exhaust gases, the improvement which comprises including in the exhaust manifold a one way non-return valve comprising a cylindrical duct, a cone in said duct having an apex angle of about 140° to 160° with its apex pointing in the direction of flow and provided with a plurality of apertures, and a membrane lying on the downstream surface of the cone and effectively clamped to the duct at the outer membrane circumference, the membrane comprising a disk of elastomeric material having a central circular aperture and which engages the hollow cone under an inherent elastic bias to completely seal the cone apertures in the closed state, the apertures of the cone having a total area which is about 1.5 to 3 times as large as the area of the aperture in the membrane.

4,324,098

HYDRAULIC CIRCUIT FOR A HYDRAULICALLY DRIVEN VEHICLE

Taketo Aruga; Koichi Morita, both of Isehara; Kenzo Hoashi, and Yasuo Kojima, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,273

Claims priority, application Japan, Nov. 18, 1977, 52-137870

Int. Cl.[3] **B62D** *11/04;* **F16H** *39/46*

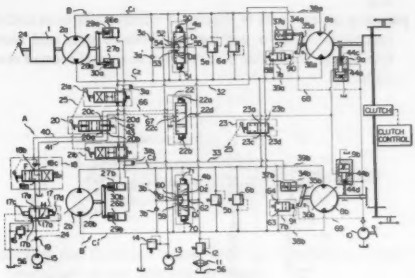
U.S. Cl. 60—420 **2 Claims**

1. In a hydraulic circuit for a hydraulically driven vehicle including a pair of variable displacement hydraulic pumps, each driven by a common engine, a pair of variable displacement hydraulic motors, each connected with said respective variable displacement pumps in a closed loop circuit and driven thereby, means for controlling the displacement of volume of said variable displacement pumps and means for controlling the displacement of said variable displacement motors, the improvement comprising:

a fixed displacement charge pump driven by said engine;

a passage means leading to tank via a relief valve means; and

a pair of pilot-operated shuttle valve means, each connected in parallel with said respective closed loop circuits and each operated by fluid pressure therein, each said shuttle valve means having a neutral position and two offset positions formed therein wherein, in each of said offset positions of said shuttle valve means a lower pressure side of a respective closed loop circuit is in open communication with said passage means and in the neutral positions of said shuttle valve means, both sides of each closed loop are connected together and both said closed loop circuits are connected with each other through said passage means and said shuttle valve means and with said charge pump, thereby equalizing the hydraulic fluid pressure in both said closed loop circuits.



4,324,099

PROCESS FOR GENERATING MOVEMENT AND ENERGY ON THE BASIS OF THE FLOTATION OF BODIES

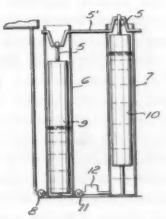
Enrique P. Palomer, Idumea 10-12, Barcelona, Spain

Filed Aug. 23, 1978, Ser. No. 935,927

Claims priority, application Spain, Aug. 25, 1977, 461.890

Int. Cl.[3] **F03B** *13/12*

U.S. Cl. 60—497 **2 Claims**



1. A process for generating movement and energy by flotation of bodies on a liquid inside receptacles, comprising the steps of:

causing said liquid to flow into a first receptacle to raise the level of said liquid inside said first receptacle, whereby a first body is raised by flotation;

sensing the level attained by said liquid in said first receptacle;

terminating the flow of liquid into said first receptacle when a predetermined liquid level is attained;

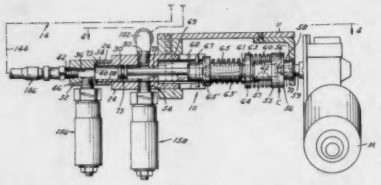
draining said liquid from said first receptacle, whereby said first body descends by gravity as the level of said liquid is lowered;

applying an external load to said first body, the raising of said first body under flotation as said liquid is caused to flow into said first receptacle and the descent of said first body under gravity as said liquid is drained from said first

receptacle alternately providing a linear reciprocating motion to said load;

causing a portion of said liquid to flow into a second receptacle containing a second flotation body as said liquid is drained from said first receptacle, whereby said second flotation body is raised through a distance until the level of said liquid is equal in said first and second receptacles; and

pumping at least part of the liquid which remains in said first receptacle, after a portion has drained into said second receptacle, from said first receptacle to said second receptacle.



4,324,100

HYDRAULICALLY CONTROLLED MIRROR

John I. House, 27201 Wellington Dr., Franklin, Mich. 48025

Filed Dec. 19, 1979, Ser. No. 105,421

Int. Cl.³ F15B *7/00*

U.S. Cl. 60—545 **2 Claims**

1. Remote control actuating mechanism for adjusting the position of an outside vehicle rearview mirror or the like, comprising a master control device and a slave device, said control device having a hydraulic control cylinder and a control piston reciprocable therein, said slave device having a hydraulic slave cylinder and a slave piston reciprocable therein, a first closed hydraulic circuit including a conduit filled with hydraulic fluid communicating at its ends with said cylinders at one side of the pistons therein, a second closed hydraulic circuit including a conduit filled with hydraulic fluid communicating at its ends with said cylinders at the opposite side of the pistons therein, a reversible electric motor for reciprocating said control piston, a motor output shaft, a second shaft aligned with said motor output shaft, a slip clutch assembly between said motor and said control piston comprising a pair of clutch discs, one of said clutch discs being secured to said motor output shaft, the other of said clutch discs being non-rotatably, axially slidably mounted on said second shaft, a nut connected to said control piston and threaded on said second shaft to effect reciprocation of said control piston by the operation of said motor, an abutment secured on said second shaft, spring means between said abutment and said other of said clutch discs to press it against said one of said clutch discs in clutching engagement, and second spring means bearing against said abutment in opposition to said first-mentioned spring means to prevent said abutment and second shaft from backing away from said clutch assembly and reducing the pressure of said first-mentioned spring means when said motor is operated to move said control piston toward said clutch assembly.

4,324,101

HYDRAULIC MASTER CYLINDERS FOR VEHICLE BRAKING SYSTEMS

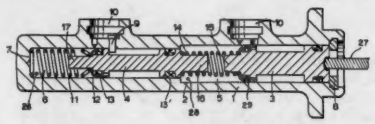
Glyn P. R. Farr, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Filed Jun. 28, 1976, Ser. No. 700,134

Claims priority, application United Kingdom, Jun. 27, 1975, 27205/75; Aug. 2, 1975, 32398/75

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **11 Claims**



1. A vehicle hydraulic tandem master cylinder comprising a housing provided with a wall defining a bore which is closed at its forward end, primary and secondary pistons in said bore with said secondary piston in front of said primary piston, said primary and secondary pistons being freely movable apart relative to each other for their maximum range of separation permitted by the dimensions of said bore, said primary piston having a front and a rear, said secondary piston having a front and a rear, an actuating rod engaging with said rear of said primary piston, first seal means sealing said primary piston to said wall, and second seal means sealing said secondary piston to said wall, said rear of said secondary piston together with said wall and said front of said primary piston bounding a primary pressure space sealed by said first and second seal means, said front of said secondary piston together with said wall bounding a secondary pressure space sealed by said second seal means, first and second outlet means passing through said wall and communicating permanently with said first and second pressure spaces respectively for connecting said pressure spaces to first and second braking circuits respectively, said front and said rear of said secondary piston having substantially equal pressure effective areas, and the ratio of the pressure effective area of said front of said secondary piston to the pressure effective area of said front of said primary piston lying in the range 0.2 to 0.8.

4,324,102

PROCESS AND SYSTEM FOR RECOVERY OF ENERGY FROM GEOTHERMAL BRINES AND OTHER HOT WATER SOURCES

Samuel G. Woinsky, Irvine, Calif., assignor to Occidental Petroleum Corporation

Continuation of Ser. No. 589,068, Jun. 23, 1975, abandoned. This application Sep. 19, 1979, Ser. No. 76,677

Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641.3 **28 Claims**

1. Process for recovery of energy from hot water-containing fluids including geothermal brines and other hot water sources, which comprises

(A) introducing a hot water-containing fluid in a heat transfer zone in direct contact heat exchange relation with a working fluid in liquid form, to heat and convert said working fluid to a heated dense phase fluid containing water and uncondensible gas, and produce a cooled water-containing fluid containing working fluid, said heat transfer zone being maintained at or above the critical pressure of said working fluid, and said hot water-containing fluid being at a temperature at or above the critical temperature of said working fluid,

(B) withdrawing said heated dense phase working fluid containing water vapor and uncondensible gas from said heat transfer zone,

(C) introducing and expanding said heated dense phase working fluid containing water vapor and uncondensible

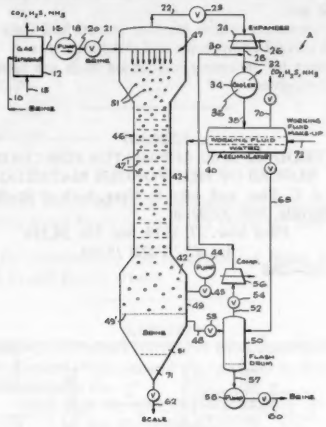
gas, in an expander to produce work, and expanded working fluid containing water vapor and uncondensible gas,

(D) discharging said expanded working fluid containing water vapor and uncondensible gas from said expander,

(E) withdrawing said cooled water-containing fluid from said heat transfer zone,

(F) flashing said cooled water-containing fluid containing working fluid to flash off said working fluid,

(G) compressing said working fluid after said flashing,



(H) mixing said working fluid after said compression with the expanded working fluid discharged from said expander to form a mixture,

(I) cooling and condensing said mixture to produce a condensed working fluid containing condensed water vapor and uncondensible gas,

(J) separating said condensed working fluid from said condensed water vapor and uncondensible gas, and

(K) returning after said separation said condensed working fluid under pressure to said heat transfer zone for reheating therein.

4,324,103

METHOD AND APPARATUS FOR REGULATING A STEAM TURBINE

Heinz Bloch, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 22, 1979, Ser. No. 5,290

Claims priority, application Switzerland, Jan. 31, 1978, 1014/78; Feb. 17, 1978, 1759/78

The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.

Int. Cl.³ F01K *13/02*

U.S. Cl. 60—663 **8 Claims**

1. A method of regulating a steam turbine, comprising the steps of:

arranging at least one resuperheater between a high pressure section and a low pressure section;

comparing a reference value and an actual value of the rotational speed of the steam turbine at said resuperheater;

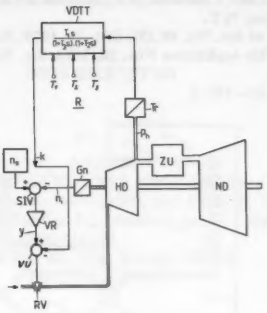
deriving a difference from the comparing of the reference value and the actual value;

providing an adjustment signal from said differences;

delivering the adjustment signal to a regulation valve arrangement of a regulation circuit;

measuring only one vapor pressure between an inlet valve of the high pressure section and an inlet of the resuperheater;

deriving from the measured vapor pressure a delayed feedback signal which at least approximately decreases to zero during steady state operation; and



coupling the feedback signal into the regulation circuit in opposition to the adjustment signal.

4,324,104

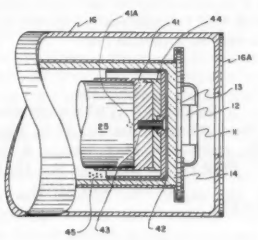
NONCONTACT THERMAL INTERFACE

Stuart B. Horn, Fairfax; Lundy H. McMillion, Fredericksburg; Howard L. Dunmire, Stafford; Geoffrey S. Sawyer, Annandale, and William C. Gerkin, Vienna, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 3, 1980, Ser. No. 137,073

Int. Cl.³ F25B *45/00*

U.S. Cl. 62—77 **1 Claim**



1. A method of increasing the heat exchange coupling efficiency between the cold finger of a mechanical cooler and a dewar spaced apart a distance in the order of the amplitude of a vibration component of said cold finger, comprising the steps of:

spacing said dewar and cold finger far enough apart to prevent physical contact and whereby mechanically induced vibrations from the cooler will not induce contact between the two surfaces;

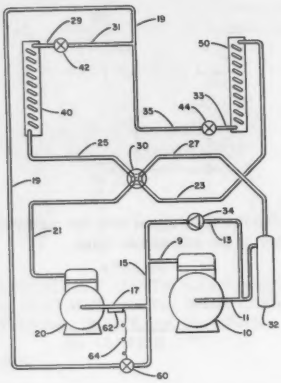
introducing a material selected from a group consisting of acetone, ethyl alcohol, methyl-alcohol, carbon tetrachloride, carbon dioxide and the inert gases between said dewar and cold finger whereby sublimation of the selected material occurs at the heat transfer point temperature to enhance the heat transfer between the two surfaces.

4,324,105

SERIES COMPRESSOR REFRIGERATION CIRCUIT WITH LIQUID QUENCH AND COMPRESSOR BY-PASS

Peter L. Cann, Canastota, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 88,259, Oct. 25, 1979, Pat. No. 4,268,291.
This application Nov. 26, 1980, Ser. No. 210,420
Int. Cl.[3] F25B *41/00*
U.S. Cl. 62—196 A 2 Claims



1. A reversible refrigeration circuit having a low stage compressor, a high stage compressor, an interconnecting line joining the low stage compressor discharge line to the high stage compressor suction line, and first and second heat exchangers which comprises:

a quench conduit connecting the heat exchanger acting as a condenser to the interconnecting line for supplying liquid refrigerant directly to the interconnecting line; and

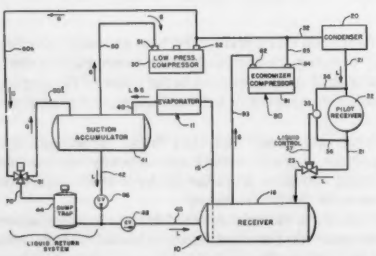
a control device for regulating the volume of flow of refrigerant through the quench conduit, as a function of the temperature of the refrigerant flowing into the high stage compressor suction line, said control device also acting to create a pressure drop so that liquid refrigerant flashes to a gas cooling the gaseous refrigerant entering the high stage compressor suction line.

4,324,106

REFRIGERATION SYSTEM

Robert R. Ross, Wheaton, and Daniel R. Bansch, St. Charles, both of Ill., assignors to H. A. Phillips & Co.

Filed Oct. 3, 1980, Ser. No. 193,748
Int. Cl.[3] F25B *41/00*
U.S. Cl. 62—197 3 Claims



1. In a recirculating refrigeration system which includes a first compressor for compressing vaporized refrigerant received from an evaporator through a suction accumulator, a condenser for receiving compressed refrigerant vapor from said first compressor, a receiver for receiving condensed refrigerant from said condenser and supplying it to said evaporator, and means for returning unevaporaed refrigerant to the receiver means from the evaporator, the improvement comprising:

(a) a second compressor;

(b) means connecting said receiver to said second compressor through which flash gas in said receiver is transmitted to said second compressor;

(c) said second compressor being effective to compress said flash gas;

(d) a condenser which receives pressurized flash gas from said second compressor and condenses it; and

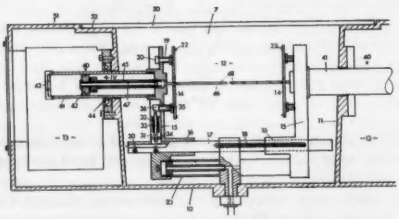
(e) means for returning condensed flash gas refrigerant to said receiver.

4,324,107

METHOD OF AND APPARATUS FOR COOLING BLOCKS OF HOT POROUS MATERIAL

William J. C. Pipe, and John B. Gray, both of Studholme St., Morrinsville, New Zealand

Filed Mar. 27, 1979, Ser. No. 24,191
Int. Cl.[3] F25B *19/00*
U.S. Cl. 62—268 11 Claims



1. Means to induce a flow of air from the interior to the exterior of a block of porous material; comprising a chamber adapted to house said block; means connected to said chamber for causing said chamber to be maintained during an operative cycle at an air pressure less than ambient air pressure; means to locate and to grip the block within said chamber; an injector needle assembly including an injector needle adapted to penetrate the said block after it has been located by the said gripping means; and means to move the injector needle into said block to allow air to flow through the said needles into and through the said porous block.

4,324,108

APPARATUS FOR FREEZING CONFECTION MATERIAL

Ronald J. Billett, Sunnyvale, and Veikko K. Viitanen, San Jose, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed May 5, 1980, Ser. No. 146,932
Int. Cl.[3] A23G *5/02*
U.S. Cl. 62—345 5 Claims

1. Apparatus for freezing confection material comprising:

mold means including a plurality of upwardly open mold cups having sidewalls depending from the open upper ends thereof and terminating in closed bottoms,

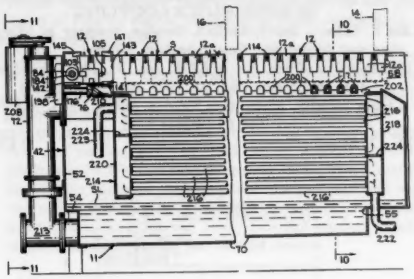
means for filling said mold cups with a predetermined quantity of freezable confection,

means for conveying said mold means along a substantially horizontal path of travel through a freezing station,

said freezing station having upwardly directed nozzle means disposed beneath said path of travel for spraying refrigerated liquid toward said mold cups for impingement thereagainst adjacent the said upper ends thereof, the refrigerated liquid thereafter flowing downwardly along the exterior surfaces of said mold cup sidewalls and bottoms

to drain therefrom, thereby to freeze the confection received in said cups,

said freezing station further having an exposed tubular heat exchanger means disposed beneath said nozzle means and



said mold means for again refrigerating the liquid as the draining liquid flows downwardly thereover into a sump, and,

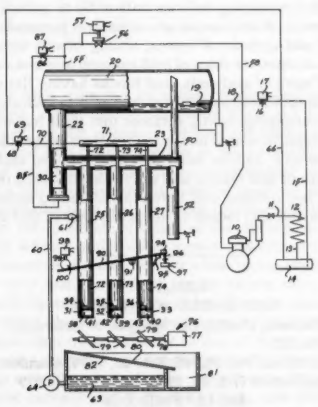
means for recirculating the re-refigerated liquid from the sump to said nozzle means.

4,324,109

ICE-MAKING APPARATUS WITH HOT GAS DEFROST

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Mar. 10, 1981, Ser. No. 242,219
Int. Cl.³ F25C *5/10*
U.S. Cl. 62—353 **6 Claims**



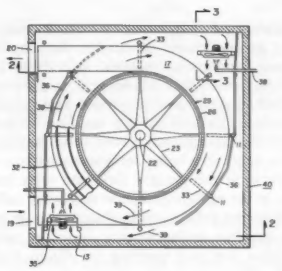
1. Apparatus for producing ice comprising vertical tube means, means for applying water to the exterior of said tube means, a header communicating with said tube means, an accumulator-separator for refrigerant, a first conduit from the lower portion of the accumulator-separator to the header for supplying liquid refrigerant thereto, a second conduit from the upper portion of the accumulator-separator connected to the header for withdrawing gaseous refrigerant, said conduits being connected to spaced portions of the header whereby liquid and gaseous refrigerant flow through the header in the same direction during ice-making, said tube means having a false bottom at its lower portion which constitutes a wall of an enclosed space, valve means in said false bottom, means urging said false bottom valve means into closed position, the weight of liquid refrigerant in said tube means tending to close said valve means, and means for supplying relatively high temperature and pressure gaseous refrigerant to the space beneath the false bottom for opening said valve means to permit gaseous refrigerant to flow upwardly into said tube means and to cause release of ice from the outer surface thereof.

4,324,110

SPIRAL-TYPE HEAT EXCHANGER

Norris G. Lovette, Jr., Breinigsville, and David R. Ruprecht, Laurys Station, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 22, 1980, Ser. No. 199,130
Int. Cl.³ F25D *25/02*
U.S. Cl. 62—381 **3 Claims**

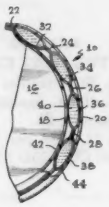


1. In a heat exchanger comprising an insulating housing having an inlet and an outlet, a horizontally rotating drum positioned in a supporting framework within said housing, conveyor means in the form of a continuous flat belt winding around the circumferential wall of said drum and defining a vertical helical path between said inlet and said outlet for passage of product through said housing, means for changing the temperature of circulating heat exchange fluid within said housing, wherein said drum is rotatively driven by a central drive shaft within said drum; the improvement which comprises a supporting superstructural framework positioned externally over the roof of said insulating housing; bearing means mounted in said superstructure; the drive shaft for said drum extending through the roof of said housing and being journaled in said bearing; mechanical means connected go the shaft extension outside said housing for rotating said shaft; said supporting framework within said housing has mounted therein at at least two diagonally opposed positions thereof a bank of axial flow fans blowing inwardly along said helical path of travel of said conveyor belt, each such bank comprising at least two fans; said means for changing the temperature of said circulating heat exchange fluid comprises a fluid discharge nozzle positioned adjacent each fan for discharging liquid refrigerant into the fan blast in a direction counter to that of the blast to effect rapid vaporization of said refrigerant; scroll means provided at each bank of fans to confine the path of heat exchange fluid movement propelled by said fans, said scroll means extending continuously from a position adjacent the periphery of the helix formed by said belt around the rotating drum and extending at least part of the way along the outer periphery of said belt, thereby causing said heat exchange fluid to flow along the path of said belt for a substantial part of its flow distance from the discharge side of one bank of fans to the intake of a second bank of fans where the negative pressure of said second bank exits.

4,324,111
FREEZING GEL CONTAINMENT STRUCTURE AND METHOD

William A. Edwards, Los Angeles, Calif., assignor to Jerry B. Gallant, Tarzana, Calif.

Filed Jun. 19, 1980, Ser. No. 160,858
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 14 Claims



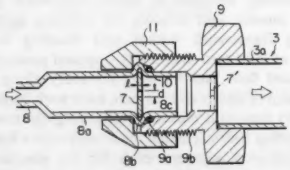
1. A freezing gel containment structure comprising:

first and second sheets of flexible thermoplastic synthetic polymer composition material, said sheets lying in a substantially face-to-face relationship, said sheets being sealed together adjacent their adges and being sealed together at intermediate parallel upright seal lines to form a plurality of adjacent upright tubes, said tubes having freezing gel therein, said tubes being sufficiently narrow in a direction transverse to the upright direction with respect to their height in the upright direction and being sufficiently filled with freezing gel that each of said tubes is self-supporting when standing in the upright direction, said sheets with said tubes and said freezing gel filling forming a panel which will stand in the upright direction and which is flexible along said intermediate seal lines so that it is bendable around an upright axis.

4,324,112
REFRIGERATION SYSTEM

Kenichi Fujiwara, Kariya; Hikaru Sugi, Nagoya, and Mineo Nishikawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 7, 1980, Ser. No. 147,501
Claims priority, application Japan, May 10, 1979, 54/57526; Jun. 29, 1979, 54/83357; Aug. 22, 1979, 54/106835; Jan. 25, 1980, 55/7555
Int. Cl.³ F25B 41/06
U.S. Cl. 62—511 7 Claims



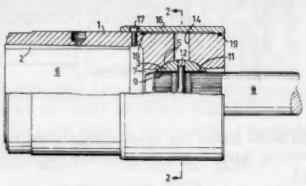
1. A refrigeration system comprising:

a refrigerant circuit which includes a condenser, an evaporator and a pressure reducing device interconnected between said condenser and said evaporator, said pressure reducing device including a flow restricting and resisting means and a flow resisting means disposed at the upstream side of said flow restricting and resisting means and adapted to impart a resistance to the refrigerant flowing therethrough, said flow restricting and resistance means comprising circular orifice means having an l/d ratio in the range of from about 0.8 to about 3.0, where l equals the length of the region of minimum diameter of said orifice means and d equals said minimum diameter.

4,324,113
SLIDING BLOCK COUPLING

Lars F. Leksen, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Continuation of Ser. No. 811,978, Jun. 30, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 971,883
Claims priority, application Sweden, Jul. 6, 1976, 7607714
Int. Cl.³ F16D 3/16
U.S. Cl. 64—7 3 Claims

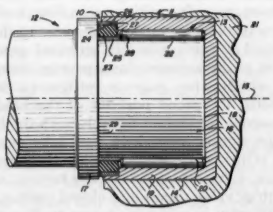


1. A sliding block coupling for interconnecting an input driving member and an output driven member in torque transmitting relationship, comprising a rotatable coupling head having a cylindrical recess perpendicular to the axis of rotation of the head, elongated means extending lengthwise of said recess, one of said members being coupled against rotation relative to said means, the other of said members being coupled against rotation relative to said head, said elongated means having flats on opposite sides of each of its ends, the surfaces of said ends between the two said flats at each end of said elongated means converging endwise outwardly to permit oscillatory movement of said means about an axis perpendicular to the axis of said cylindrical recess, sliding blocks disposed in said recess on opposite sides of said rotation axis and on opposite sides of each of said ends, said blocks having flat surfaces that slide on said flats, said blocks and said cylindrical recess having interengaging sliding surfaces that limit movement of said blocks relative to said means to directions perpendicular to said rotation axis, annular seals that seal between said means and said walls of said recess, said seals being disposed on opposite sides of said rotation axis, between said sliding surfaces and said rotation axis, and means closing both ends of said cylindrical recess.

4,324,114
MOVEABLE JOINT SEAL

Donald F. Durham, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 38,986, Feb. 26, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,079
Int. Cl.³ F16D 3/26
U.S. Cl. 64—17 A 17 Claims



1. In a universal joint (11) having a journal trunnion (12) defining an axial of rotation (15) and being mounted for rota-

tion about said axis by an axially outer annular bearing (13) in a bearing cap retainer (14), the bearing being retained against axially outward displacement by said retainer, an improved seal (10) for movably sealing the journal trunnion to the bearing retainer for maintaining bearing lubricant therein and prevent entry of foreign matter thereinto, said seal comprising:

an elastic seal ring (23);

first (24) and second (25) right circularly cylindrical annular sleeves bonded to diametrically opposite portions of the seal ring, the diameters of said sleeves being preselected to place said seal ring under compressive preload; and

means on said journal trunnion and bearing retainer defining first and second pairs of confronting annular surfaces (20,26 and 29,27), said sleeves seating respectively against the annular surfaces (20,26) of said first pair and said seal ring sealingly engaging the annular surfaces (17,27) of said second pair, said bearing being retained against axially inward displacement by one of said sleeves.

4,324,115
FLATBED KNITTING MACHINE WITH PULSE GENERATOR FOR ELECTRONIC CONTROL

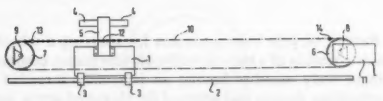
Erich Krause, Bopfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed May 14, 1980, Ser. No. 149,879

Claims priority, application Fed. Rep. of Germany, May 14, 1979, 2919369

Int. Cl.³ D04B *7/00, 15/66*

U.S. Cl. 66—75.2 **3 Claims**



1. In a high capacity, automatic, flatbed knitting machine comprising a cam carriage movable back and forth over a needle bed, a pulse generator which comprises a pulse-initiating disc and two cycle signallers at the circumference of the disc and which produces pulses corresponding to the needle cycle for the electronic control of the machine, the improvement comprising: an endless chain stretched on the machine frame in the direction of travel of the carriage between two sprocket wheels, and pick-up means connecting the carriage being driven by a separate drive chain to the endless chain in such a way that the pick-up means moves on a linear taut portion of the endless chain at least within the utilisable working region of the pulse generator, the pulse-initiating disc being connected directly and fixedly to one of the sprocket wheels and thereby driven in synchronism with the movement of the carriage over the needle bed by a positive linked contact between the carriage and the endless chain, said pulse-initiating disc having a peripheral pulse-initiating pitch corresponding in whole number multiples with the pitch of needles mounted on the bed, and said endless chain driving exclusively the pulse-initiating disc.

4,324,116
TWIN BELT VACUUM WASHER

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Division of Ser. No. 934,773, Aug. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 853,068, Nov. 21, 1977, Pat. No. 4,160,297. This application Apr. 21, 1980, Ser. No. 141,865

Int. Cl.³ D06B *3/02*

U.S. Cl. 68—158 **6 Claims**

1. A machine for washing paper stock pulp and other vacuum-filterable materials comprising:

a. first and second horizontally-disposed drums each having a sidewall through which liquid can pass, said drums being mounted for rotation about their horizontal axes and disposed in side-by-side relationship;

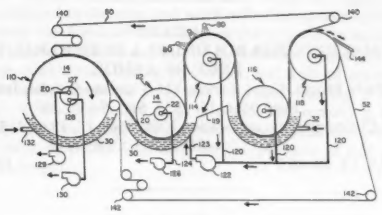
b. a third horizontally-disposed drum mounted for rotation about its horizontal axis and disposed between said first and second drums, said third drum being mounted higher than said first and second drums;

c. two tanks mounted to encompass at least the lower part of said first and second drums, said tanks being constructed to contain liquid exterior to said drums;

d. first and second endless filter belts trained to pass under said first and second drums and over said third drum in face-to-face relationship with each other to hold a mat of material to be washed;

e. feed means to deposit the vacuum-filterable material between said first and second endless filter belts;

f. a first set of roller means mounted above said drums to



guide said first endless filter belt from said second drum to said first drum, and a second set of roller means mounted below said drums to guide said second endless filter belt from said second drum to said first drum;

g. drive means mounted to drive said first and second endless belts;

h. liquid inlet means to introduce liquid into said tanks associated with said first and second drums; and,

i. vacuum means connected in communication with said first and second drums to provide a pressure differential between the mat of material held between said first and second endless belts and the liquid contents of the associated said tanks thereby to force liquid from the tanks through the material, wherein said liquid inlet means includes means coupled to said vacuum means associated with said second drum to transfer the liquid removed from said second drum into said tank associated with said first drum.

4,324,117
JET DEVICE FOR APPLICATION OF LIQUID DYE TO A FABRIC WEB

Charles J. Schwob, Dayton; Nicholas Kirbabas, Kettering, and Tim Erin, Beavercreek, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 11, 1980, Ser. No. 158,200

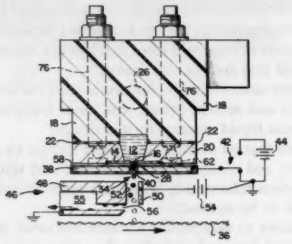
Int. Cl.³ D06B *1/02;* **B05B** *5/08*

U.S. Cl. 68—205 R **13 Claims**

11. A jet drop charging device for controllably charging drops formed from a plurality of fluid filaments produced by a jet coating head, said fluid filaments being arranged in a row, comprising

a charging plate of electrically conductive material defining an elongated slot into which said fluid filaments extend, whereby said drops are formed from said fluid filaments within said slot, said charging plate being coated with an electrically non-conductive material on its surface and said slot being free of said non-conductive material,

and means for applying an electrical charge potential to said charging plate, whereby electrical charges are induced in



the tips of said fluid filaments and are carried away by drops formed therefrom.

4,324,118

MACHINE FOR ROUGHING A PERIPHERAL VAMP EDGE OF A SHOE

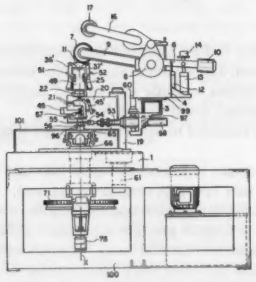
Mario Bruggi, Corso Torino, 114 Vigevano (Pavia), Italy

Filed Mar. 16, 1979, Ser. No. 21,203

Claims priority, application Italy, Mar. 17, 1978, 21322 A/78

Int. Cl.[3] **A43D** *37/00;* **C14B** *1/44*

U.S. Cl. 69—6.5 **14 Claims**



1. A machine for roughening a peripheral edge of a vamp of a shoe mounted in upside-down position on a last, comprising:

a turntable rotatable about a principal vertical axis;

a carriage linearly reciprocable on said turntable;

mounting means on said carriage for removably supporting a pair of vertically spaced templates with profiles respectively conforming to those of a pair of shoes whose vamps are to be peripherally roughened;

a first and a second arm mounted on a baseplate for independently swinging about respective collateral vertical axes;

a feeler on a free extremity of said first arm positionable to contact either of said templates;

a rotary roughening brush carried on said free extremity above said feeler;

a beam hinged to said second arm above the level of said mounting means;

a vertical shaft journaled in said beam at a location remote from said second arm and provided with coupling means for releasably connecting said shaft with said mounting means;

a shoe-supporting unit mounted on said shaft above said beam and provided with clamping means for gripping a shoe to be roughened in upside-down position and in line with the corresponding template at a level within reach of said brush;

drive means for rotating said brush;

first actuating means for moving said first arm into a position of engagement of said feeler with the template corresponding to a shoe gripped by said clamping means;

second actuating means for displacing said brush relatively to said first arm for working contact with the peripheral vamp edge of the shoe gripped by said clamping means;

third actuating means for linearly reciprocating said carriage on said turntable between respective terminal positions in which the heel and the toe of the gripped shoe are substantially centered on said principal axis; and

fourth actuating means operative in each of said terminal positions for rotating said turntable through 180°.

4,324,119

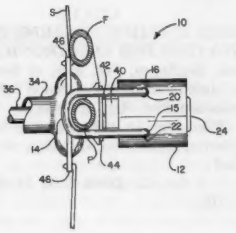
PASSIVE WHEEL LOCK FOR BICYCLES AND THE LIKE

David Mitton, 425 W. Mulberry St., Fort Collins, Colo. 80521

Filed Mar. 17, 1980, Ser. No. 130,694

Int. Cl.[3] **B62H** *5/00;* **E05B** *67/05, 71/00;* **F16B** *41/00*

U.S. Cl. 70—233 **3 Claims**



1. Passive bicycle lock apparatus for securing a wheel axle and hub assembly of a bicycle to the bicycle frame, comprising:

a main body member having an internally threaded bore extending therein and adapted for threaded screw mounting on the externally threaded axle bolt of the bicycle;

securing means releasably attachable to said main body member and adapted for passing around and engaging a portion of the bicycle frame adjacent said main body member in such a manner that restrains said body member from rotation on said axle in relation to the frame and thereby securing said main body member in immovable position on the axle bolt; and

lock means for releasably engaging said securing means and locking it in attachment to said main body member.

4,324,120

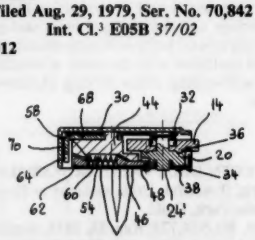
PERMUTATION LOCK, PARTICULARLY FOR HANDBAGS AND SUITCASES

Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Selzach, Switzerland

Filed Aug. 29, 1979, Ser. No. 70,842

Int. Cl.[3] **E05B** *37/02*

U.S. Cl. 70—312 **10 Claims**



1. In an arrangement of a permutation lock, particularly for use in connection with handbags and suitcases, including at least two lock stopping devices each having an arresting disc provided with an intake recess cooperating via multipoint arresting devices with a setting disc to adjust the angular posi-

tion of the latter relative to the intake recess, an actuation slider movable between a closing position and an opening position, and at least one tumbler slider spring-biased into a closing position and cooperating with the actuation slider, a combination comprising at least one arresting slider spring-biased against said arresting disc and including arresting tongues engageable with said intake recesses and a projection formed opposite to said arresting tongues; said actuation slider having openings for receiving said projection when said actuation slider is in its closing position and thus allowing disengagement of said arresting tongues from said intake recesses; and abutments arranged on said actuation slider for stopping said projection when said actuation slider is in its opening position and thus preventing the disengagement of said arresting tongues from said intake recesses and permitting the angular displacement of said setting discs relative to said arresting discs.

4,324,121

KEY RING

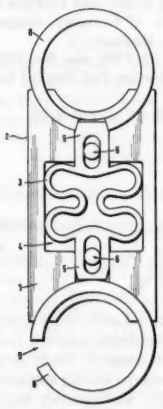
Herbert Richter, Birkenfelder Str. 1-7, Pforzheim-Bue, Fed. Rep. of Germany (7530)

Filed Jan. 28, 1980, Ser. No. 116,273

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 7902447[U]; Feb. 12, 1979, 7903847[U]

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—459 **7 Claims**



1. A key ring comprising: a handle portion having a circular passage extending therethrough at least at one end; a metal ring rotatably disposed in said circular passage, said metal ring having an open segment area; a latch member movably supported in said handle portion; said handle portion having a narrow cavity and spring means having interconnected undulated sections arranged in spaced parallel relationship disposed and contained in said cavity for biasing said latch member toward said metal ring and into said open segment area when said open segment area is in the path of movement of said latch member for locking said ring in position; said latch member being movably supported in said handle portion in a passage which intersects, and extends normal to, said circular passage, and said latch member further having a portion extending at least to the surface of said handle portion at least at one side thereof so as to permit movement of said latch member out of engagement with said metal ring in order to allow rotation of the metal ring for removal and insertion of keys.

4,324,122

METAL STRIP COLD-REDUCTION MILL

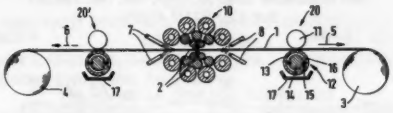
Peter Urban, Meerbusch-Osterrath, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,753

Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917641

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—41 **7 Claims**



1. A metal strip cold-reduction mill comprising work rolls between which the strip is cold-rolled, means for applying liquid lubricant to the strip and work rolls during cold rolling of the strip, the lubricant remaining on the rolled strip leaving the work rolls, a tension reel on which the rolled strip is coiled with one convolution on top of another, and a set of squeeze rolls between the work rolls and reel and forming a nip through which the rolled strip is passed for removing the lubricant from the strip; wherein the improvement comprises controllable means for adjusting the line pressure of said nip along its length.

4,324,123

SOIL CULTIVATING IMPLEMENTS

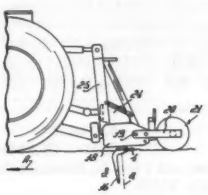
Cornelius Van Der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 25, 1979, Ser. No. 88,160

Claims priority, application Switzerland, Oct. 27, 1978, 7810716

Int. Cl.³ A01B *33/06*

U.S. Cl. 172—49.5 **8 Claims**



1. A soil cultivating implement comprising a frame and a plurality of soil working members arranged in a transverse row for rotation about an upwardly extending axis, at least one of said soil working members having a substantially vertical shaft that defines its axis of rotation and a single tine supported adjacent the lower end of said shaft, an upper fastening portion of said tine being connected to said shaft by clamping means, said lower shaft end comprising a substantially flat supporting part that mounts a downwardly extending stub shaft, the upper side of said fastening portion being substantially horizontal and flat with downwardly extending cheek sides and having an aperture that receives said downwardly extending stubshaft, said stubshaft extending through said fastening portion and into a protected open space defined by the cheek sides, below said supporting part, said clamping means securing the upper surface of said fastening portion against the lower side of said flat supporting part, and soil working portion having an upwardly extending inner cavity that merges into the lower surface of said fastening portion and defines said protected space between said cheek sides, said cheek sides defining a U-shaped open space with one cheek being located in advance of the other relative to the direction of rotation of the soil

working member, said cavity extending for a substantial distance along the length of the lower soil working portion of said tine.

4,324,124

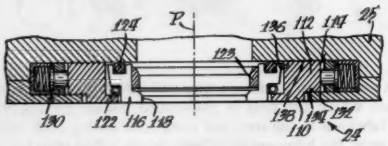
STRIPPER ASSEMBLY FOR BODYMAKER

Edward G. Maeder, Minnetonka, Minn., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 900,272, Apr. 26, 1978, Pat. No. 4,262,512. This application Jun. 16, 1980, Ser. No. 160,067

Int. Cl.³ B21D *45/00*

U.S. Cl. 72—345 **4 Claims**



1. In an ironing machine having a frame and at least one ironing assembly and a stripper assembly spaced from said ironing assembly with said assemblies having openings defining a path and a punch movable along said path to iron a sidewall of a cup and produce a container, the improvement of said stripper assembly including a stripper support element having a plurality of circumferentially spaced stripping jaws supported thereon and cooperating with each other to define the opening therein, first means normally maintaining said stripping jaws in a first position and accommodating movement from said first position to enlarge said opening to allow said container to pass therethrough, a support between said frame and said stripping jaws, said frame having a flat surface extending perpendicular to said path adjacent said ironing assembly and said support having a cooperating surface engaging said flat surface, and a plurality of opposed circumferentially spaced biasing means between said support and frame normally biasing the center of the opening concentric with said path and being compressible to accommodate radial movement of said support, said stripping jaws and said first means as a unit relative to said path when the center of said punch is eccentric to the center of said opening in said stripper assembly.

4,324,125

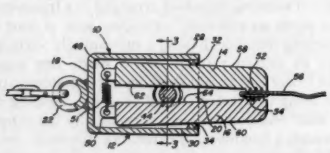
AUTO BODY CLAMP

Davis R. Jarman, and Virgil H. Hinson, both of Box 113, Rte. 3, Brunswick, Ga. 31520

Filed Nov. 9, 1979, Ser. No. 92,921

Int. Cl.³ B21D *1/12*; A44B *21/00*

U.S. Cl. 72—479 **11 Claims**



1. An auto body gripping clamp including a base component defining a pair of spaced opposing abutment surfaces, a pair of elongated levers laterally facing each other and including first and second pairs of corresponding end portions projecting in opposite directions from opposite sides of a plane transverse to said levers and containing said abutment surfaces, said levers being supported from said base component for longitudinal shifting relative thereto, said first pair of end portions projecting from one side of said plane defining opposing jaw faces for clamping an auto body portion therebetween, means carried by said base component for attaching a pull member thereto for applying a pulling force thereon in a direction opposite to the direction in which said first pair of end portions project, said levers including pairs of remote and adjacent longitudinal surfaces, wedge means shiftably supported from said base component on the other side of said plane between said adjacent surfaces of said levers for selectively wedging said second pair of end portions apart and shifting of said wedge means with said levers longitudinally of said base, said remote surfaces being slightly divergent toward said second end portions when said second end portions are wedged apart by said wedge means, said remote surfaces being slidably engageable with said abutment surfaces to cam said first pair of end portions toward each other upon shifting of said levers and said wedge means relative to said base component longitudinal direction of said levers in which said first end portions thereof project, said base component comprising a tubular housing having a first open end from which said first pair of end portions project, said abutment surfaces being supported from opposite side portions of said tubular housing adjacent said open end thereof, said wedge means comprising a longitudinally tapered elongated wedge extending transversely of said levers and housing and including opposite side longitudinal convergent wedge surfaces shiftable lengthwise and transversely between said adjacent surfaces with said wedge surfaces opposing and engaging said adjacent surfaces and the opposite ends of said wedge projecting through opposite side portions of said housing.

4,324,126

CALIBRATION DEVICES

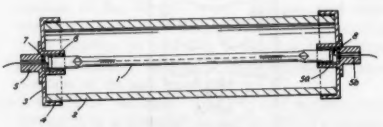
Volker Riech; Wolfgang Saupe, and Dietrich Sorgenicht, all of Leverkusen, Fed. Rep. of Germany, assignors to Daystrom Limited, Glouchester, England

Filed May 20, 1980, Ser. No. 151,570

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920529

Int. Cl.³ G01B *9/00*

U.S. Cl. 73—1 J **8 Claims**



1. A calibration device for calibrating apparatus for measuring a dimension of hot luminous material, the device comprising a hollow elongated member made from a translucent, temperature-resistant material having a relatively low coefficient of thermal expansion, said member having an elongated light source disposed along its longitudinal axis but spaced from the internal surface thereof to reduce heat transfer therebetween, whereby in use, the device simulates such luminous material while operating with said member at a substantially lower temperature than that of such luminous material.

4,324,127

SPIROMETER CALIBRATION DEVICE AND ASSOCIATED DISPLACEMENT DETECTION SYSTEM

Peter Gazzara, Reading; John W. Burke, Jr., Melrose, and Rodney Edwards, Jr., Framingham, all of Mass., assignors to Biotrine Corporation, Woburn, Mass.

Filed Nov. 19, 1979, Ser. No. 95,484

Int. Cl.³ G01F *25/00*

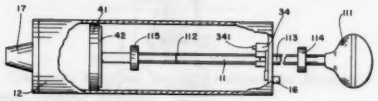
U.S. Cl. 73—3 **5 Claims**

1. A calibration device comprising:

first means, for displacing a given volume, such first means including (i) a structure and (i) a member movably mounted so as to permit displacement thereof with respect

to the structure, displacement of the member with respect to the structure causing displacement of a volume;

second means, for sensing, in the course of displacement by the first means of the given volume, the acts of commencement and termination of the displacement by the first means of a known volume, the known volume being equal to or less than the given volume, such second means including (i) a starting tripper, mounted in fixed relation to one of either the member or the structure, (ii) a stopping tripper mounted in fixed relation to the starting tripper, and (iii) a sensor, responsive to the physical proximity of the starting tripper and to that of the stopping tripper, and



mounted in fixed relation to the other of the member or the structure, and thereby in movable relation to the trippers, so that displacement of the member with respect to the structure causes the trippers to excite the sensor at both the commencement and the termination of displacement by the piston of the known volume, and wherein (a) the sensor includes a Hall-effect device, for responding to proximate magnetic field changes, and (b) the starting and stopping trippers each include fifth means, for causing magnetic field changes in the vicinity of the sensor when the fifth means is proximate thereto; and

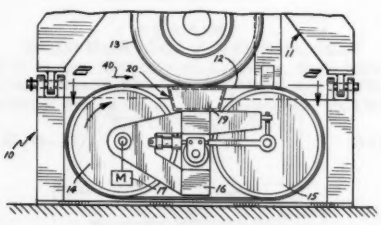
third means, for measuring the elapsed time between such commencement and termination.

4,324,128

HYDRODYNAMIC SUPPORT BEARING FOR A BELT ON A TIRE TESTING MACHINE

William J. Langer, Eden Prairie, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Feb. 14, 1980, Ser. No. 121,399
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—8 **8 Claims**



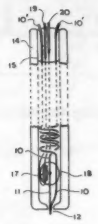
1. In an endless flexible belt assembly including a belt having a lateral width, and a pair of rollers supporting the belt for movement in a closed path, said rollers being spaced apart to provide a center belt length between the rollers with the belt moving in a first direction in the center length and being loaded in the center length, the improvement comprising a hydrodynamic bearing mounted in position to support the center belt length, said hydrodynamic bearing comprising a block member having a surface that is generally planar and which supports the center belt length on a side thereof opposite the side on which the belt is being loaded, a plurality of generally parallel grooves extending generally perpendicular to the direction of movement of said belt and spaced apart in direction of movement of the belt, said grooves being of length less than the lateral width of said belt and terminating short of the edges of said block member, and means to supply a liquid to each of said grooves at a low pressure in a desired amount sufficient so the pressure necessary to support the belt on a liquid film is generated by the belt creating shear in the liquid between the grooves to provide hydrodynamic pressure between the belt and the block member as a function of belt velocity relative to the block member, liquid viscosity and loading on the belt as the belt is moved.

4,324,129

METHOD AND MEANS FOR DISTINGUISHING GEMSTONES

Hiroshi J. Goldsmid, Beecroft, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Mar. 18, 1980, Ser. No. 131,352
Claims priority, application Australia, Mar. 28, 1979, PD8221
Int. Cl.³ G01N *25/18*
U.S. Cl. 73—15 A **7 Claims**



1. A method of identifying a material by determining its thermal conductivity, comprising the steps of applying to a material a thermocouple including two dissimilar metals and having junctions spaced relatively close to each other and forming thermocouple branches, and a high thermal conductivity tip at one of said junctions; continuously supplying heat to the other of said junctions at least up to just prior to making contact between said thermocouple and the material; pressing said tip at said one junction into contact with said material so that heat flows through at least part of one of the thermocouple branches; recording the thermoelectric e.m.f. developed between said junctions; and identifying the material by reference to the maximum thermoelectric e.m.f. or to the rate of change of e.m.f.

4,324,130

METHOD AND APPARATUS FOR MEASURING THE MELTING TEMPERATURE OF GREASY PRODUCTS

Benjamin Driker, 35-04 21 Ave., Astoria, New York, N.Y. 11105

Filed Aug. 25, 1976, Ser. No. 717,541
The portion of the term of this patent subsequent to Apr. 13, 1996, has been disclaimed.
Int. Cl.³ G01N *25/04*
U.S. Cl. 73—17 R **7 Claims**

1. A method of measuring the melting temperature of greasy products in a liquid flow thereof comprising:

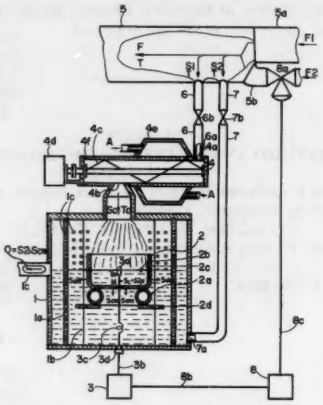
forming a continuous flow of first and second liquid streams from said product;

freezing said first stream to a snow-like state;

feeding said second liquid stream to a container;

feeding said snow-like material into a vessel having perforated walls, said vessel resiliently supported in the liquid in said container, whereby the liquid in said container passes through the vessel walls to mix with and melt the snow-like material, and the depth of the vessel in said liquid changes in response to changes in mixture weight

which in turn changes with variations of melting temperature; and,



continuously measuring the temperature of material in the vessel.

4,324,131

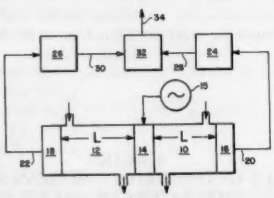
LIQUID CHROMATOGRAPHY DETECTOR

Allan Rosencwaig, 134 Timberline Ct., Danville, Calif. 94526

Filed Apr. 9, 1980, Ser. No. 138,529

Int. Cl.³ G01N *15/00*

U.S. Cl. 73—61.1 C **17 Claims**



1. A method for measuring the concentration of a solute in a solvent, comprising:

flowing solvent containing the solute through a first chamber and flowing pure solvent through an identical second chamber;

sending acoustic waves of equal amplitude into the two chambers;

detecting the amplitudes of attenuated acoustic signals from each of the two chambers producing detector signals;

measuring a difference signal between the detector signals from the two chambers;

determining the change in acoustic attenuation of the solvent due to the presence of the solute from the measured difference signal; and

determining the concentration of the solute from a predetermined relationship of the change in acoustic attenuation as a function of concentration for the solute.

4,324,132

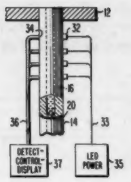
APPARATUS AND METHOD FOR MEASURING THE RATE OF EVAPORATION OF A LIQUID

Richard Williams, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 139,738

Int. Cl.³ G01N *33/00*

U.S. Cl. 73—61.3 **16 Claims**



1. A method for measuring the rate of evaporation of a liquid comprising the steps of:

connecting a capillary tube to a sheet of fibrous material;

saturating the sheet with liquid;

providing to said sheet additional liquid sufficient to cause liquid to flow from said liquid-saturated sheet into said capillary tube to establish hydraulic continuity of the liquid in the sheet and in the capillary tube; and

determining the rate of evaporation of the liquid by movement of the liquid drawn through the tube as the liquid evaporates from the sheet.

4,324,133

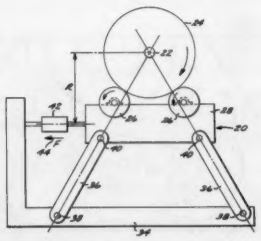
TORQUE MEASURING DEVICE

David J. Stevenson, Arcadia, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed May 16, 1980, Ser. No. 150,625

Int. Cl.³ G01L *3/02*

U.S. Cl. 73—117 **30 Claims**



1. In a device for measuring torque the combination which comprises:

a roller rotating about an axis;

a support member relative to which the roller is rotatably mounted in a relationship wherein the roller imparts a force upon the support member;

support means for supporting the support member relative to a fixed object such as the ground, said support means including at least two linkage arms connecting the support means to the fixed object, each linkage are being pivotably mounted to the fixed object at a first point of mounting and being pivotably mounted to the support member at a second point of mounting and disposed in such a manner that a geometrical line drawn between the first and second points of mounting of each linkage arm substantially intersects the axis of rotation of the roller;

power absorbing means operatively connected to the sup-

port member for absorbing rotational power of the roller, and

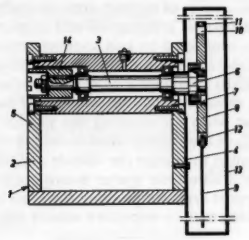
force measuring means mounted between the support member and the fixed object for measuring the force imparted by the roller to the support member, said force having a perdetermined known lever arm relative to the axis of rotation of the roller, said force measuring means functioning in a manner so that the respective lines interconnecting the first and second mounting points of the linkage arms remain substantially stationary regardless of the magnitude of the force being imparted to the support member whereby a torque of the roller may be calculated from the measured force and the known lever arm.

4,324,134

MOTOR TEST STAND

Kurt I. Carlsson, Brastad, Sweden, assignor to Jonsereds Aktiebolag, Partille, Sweden

Filed Jun. 9, 1980, Ser. No. 157,489
Int. Cl.³ G01L *5/00*
U.S. Cl. 73—117.1 **14 Claims**



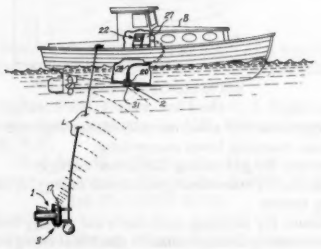
1. A test stand for motors, comprising a stand, an axle rotatably mounted in said stand, coupling means on said axle for coupling said axle for rotation to a motor, a brake rotor mounted for rotation to said axle, and a plurality of flexible brake elements mounted on said rotor at the periphery thereof, said brake elements comprising elongated members.

4,324,135

SPEED INDICATOR FOR FISHING GEAR

Ralph B. Peyton, 18511-67th W., Lynnwood, Wash. 98036

Continuation-in-part of Ser. No. 28,004, Apr. 9, 1979, abandoned. This application Feb. 12, 1980, Ser. No. 120,841
Int. Cl.³ G01C *21/10*
U.S. Cl. 73—187 **33 Claims**



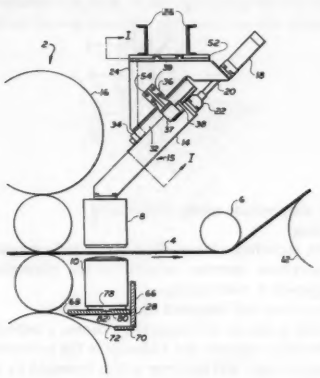
1. The method of measuring the trolling speed of fishing gear being trolled by a fishing boat which comprises positioning a water speed sensor at approximately the trolling depth for detecting the speed of such sensor relative to surrounding water, generating a first electrical signal of such speed detected by the water speed sensor, converting such first electrical signal to a sonic signal of such speed for effecting transmission of such sonic signal through the water, receiving such transmitted sonic signal at the boat, converting such received sonic signal to a second electrical signal of such speed, and actuating a display of such speed at the boat by such second electrical signal.

4,324,136

BETA GAUGE MECHANISM

R. Daniel Ashford, Davenport, Iowa, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 5, 1979, Ser. No. 72,621
Int. Cl.³ G01N *21/86, 21/89, 23/16, 23/18*
U.S. Cl. 73—159 **1 Claim**



1. Apparatus for supporting transducer heads in a measuring device used in conjunction with producing a horizontally moving continuous strip material comprising:

(a) a rigid frame means permanently secured with respect to the horizontal strip material;

(b) a lower horizontal support means for supporting a lower transducer head below said horizontal strip material;

(c) a support bracket connected to said rigid frame means;

(d) a slide assembly, having a longitudinal axis, said slide assembly comprising an upper and lower slide block adapted to slide longitudinally in relation to each other with said upper slide block rigidly attached to said support bracket and said slide assembly disposed with its longitudinal axis in a plane that is perpendicular to the horizontal strip material and parallel to the direction of travel of the horizontal strip material;

(e) an upper support member, having a longitudinal axis, and said support member having a lower end adapted for attachment to an upper transducer head and having an upper portion connected to said lower slide block so that said support member can movably slide up and down;

(f) a cover plate having an upper portion attached to a lower end surface of said upper slide block and a lower portion extending downward adjacent to at least a portion of a lower end surface of said lower slide block so as to provide a restraint on the downward sliding motion of said lower slide block when said upper transducer head is in a measuring position;

(g) a hydraulic cylinder and a piston and piston rod assembly contained therein, coaxially aligned with the longitudinal axis of said support member, having the lower end of said piston rod rigidly attached to the upper end of said support member and a portion of said cylinder attached to a portion of said support bracket; and

(h) deceleration means for gradually and uniformly braking downward motion of said lower slide block and thereby preventing said lower slide block from contacting said cover plate with excessive impact when said upper trans-

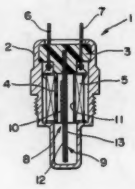
ducer head is lowered from an upper position to the measuring position.

4,324,137

TEMPERATURE SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,812
Int. Cl.³ G01K 5/62
U.S. Cl. 73—362 CP 7 Claims



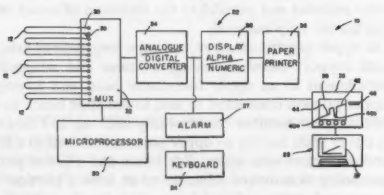
1. A temperature sensor comprising
a casing;
a core, including a bimetallic element and a magnetically soft amorphous member secured to the bimetallic element, disposed in said casing;
an electrical coil disposed about said core;
wherein a change in temperature causes a deflection of said bimetallic element and a change in the permeability of the magnetically soft member which is sensed by said electrical coil.

4,324,138

METHOD OF AND APPARATUS AND SYSTEM FOR DETERMINING TEMPERATURE CONDITIONS

Bayard C. Davis, Lombard, and Donald H. Heyden, Inverness, both of Ill., assignors to Alarma Systems Incorporated, Elgin, Ill.

Filed Mar. 16, 1978, Ser. No. 887,089
Int. Cl.³ G01K 7/02
U.S. Cl. 73—341 42 Claims



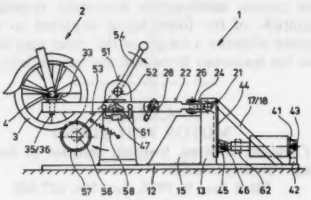
1. A method of determining temperature conditions within an environment through utilization of one or more transducers comprising:
(a) selecting a scanning program form a plurality of scanning options to control transducer scanning;
(b) scanning at least one transducer in accordance with said program to sense signals generated by said transducer;
(c) monitoring said scanned transducer to identify a transducer generating a signal of interest deviating more than a preselected minimum from a pre-established norm; and
(d) converting said signal of interest of said monitored transducer into a signal indicative of a temperature of interest.

4,324,139

BALANCING DEVICE FOR VEHICLE WHEELS ETC.

Karl-Heinz Mühlau, Ludwig-Herr-Strasse 20, D-7880 Bad Säckingen, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,087
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917993
Int. Cl.³ G01M 1/28
U.S. Cl. 73—457 11 Claims



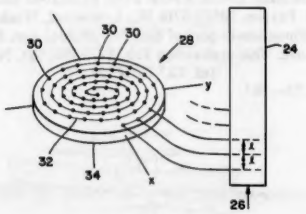
1. A balancing device for one wheel of a vehicle comprising, a support frame, a pair of support arms pivotally mounted for horizontal and vertical pivoting on said support frame, stress sensing means connected to said support arms for sensing a stress applied thereto, drive means connected to said support frame and adapted to engage a wheel to be balanced for rotating the wheel, raising means connected to the frame and to the pair of support arms for pivoting the pair of support arms vertically, each of the support arms including vehicle engagement ends adapted to engage the vehicle and lift the wheel to be balanced, and adjustable spacer means connected between the pair of support arms for pivoting the arms horizontally to adjust the spacing of their respective vehicle engagement ends.

4,324,140

ELECTRONICALLY SIMULATED ROTATING PRISM FOR ULTRASONIC BEAM SCANNING

Bertram A. Auld, Menlo Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 31, 1980, Ser. No. 174,292
Int. Cl.³ G01N 29/00
U.S. Cl. 73—602 8 Claims



1. Apparatus for electronically deflecting and rotating an ultrasonic scanning beam comprising:
(a) means for generating ultrasonic energy;
(b) means for transmitting electrical energy to said generating means;
(c) means for delaying said electrical energy such that said transmitting means transmits electrical energy of predetermined phase to said generating means; and
(d) an electrical input signal introduced as input to said delaying means, said electrical input signal having the form

$$V_{IN} = V_o \exp(i\omega_o t + iA \cos \Omega t),$$

where A is a multiplication factor dependent on the geometry of said apparatus.

4,324,141

ULTRASONIC MEASUREMENT OF THICKNESS

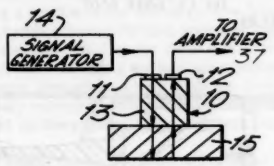
Richard J. Stearn, Milton Keynes, England, assignor to Balteau Sonatest Limited, Buckinghamshire, England

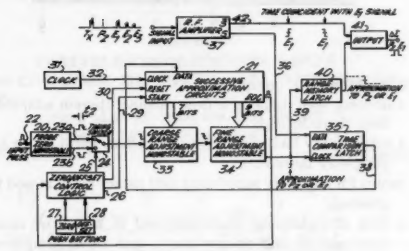
Filed Jan. 8, 1980, Ser. No. 110,557

Claims priority, application United Kingdom, Jan. 8, 1979, 00596/79

Int. Cl.³ G01N 29/00

U.S. Cl. 73—627 16 Claims





1. A method of measuring the thickness of a test piece using an ultrasonic probe comprising ultrasonic pulse transmitting and receiving means mounted on an acoustic stand-off, the method comprising placing the probe on a block which has a determined pulse transit time, duplicating said transit time as a first time-value signal, detecting the first return echo received by the pulse receiving means from the remote face of the block, setting up a storable second time-value signal representative of the time period from the transmission of a pulse by said pulse transmitting means to the receipt of the first such return echo arising from said pulse by automatically approximating the position in time of the first return echo, and using said first time-value signal and a recalled duplicate of said second time-value signal under the control of manual control means to adjust the probe output values for the acoustic delay time of the stand-off material.

4,324,142

CIRCUIT FOR PROCESSING THE SIGNALS RECEIVED BY A MOSAIC OF ULTRASONIC TRANSDUCERS IN B-MODE ECHOGRAPHY

Michel J. Auphan, Paris, France, and Ludo C. J. Baghuis, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,662

Claims priority, application France, Jul. 4, 1979, 79 17379

Int. Cl.³ G01N 29/04

U.S. Cl. 73—626 2 Claims

1. A circuit for processing echo signals which are produced, in reaction to a series of emitted ultrasonic pulses, by a mosaic of ultrasonic transducers, the mosaic being formed by n first electrodes which are disposed as parallel lines on a first principal surface of a plate of electrostrictive material and which can be polarized independently of each other and by 2p second electrodes which are disposed as parallel lines which extend perpendicular to the first electrodes, comprising:

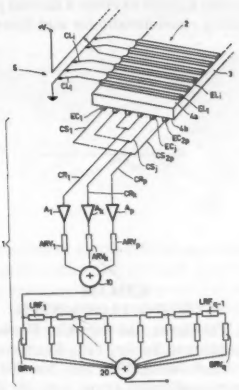
p amplifiers each amplifier having an input, which is connected to a symmetrical pair of said second electrodes, and an output;

p first variable delay lines each first delay line having an input, which is connected to the output of a corresponding one of the amplifiers, and an output;

a first adder having p inputs, each of which is connected to an output of a corresponding one of the first delay lines, and an output;

a cascade network of q−1 fixed delay lines, the input of a first delay line in the cascade being connected to the output of the first amplifier;

q second variable delay lines, one of said second variable delay lines having an input connected to the output of the first amplifier and each of the remaining second variable delay lines having an input connected to the output of a



corresponding one of the q−1 delay lines in the cascade network; and

a second adder having q inputs, each connected to the output of a corresponding one of said second delay lines, and an output which supplies processed echo signals;

the delay times of the first variable delay lines being determined so that the amplifiers, first variable delay lines and the first adder form the electrical equivalent of a first cylindrical ultrasonic lens whose axis extends parallel to the second electrodes and the delay times of the second variable delay lines being controlled so that the fixed delay lines, the second variable delay lines and the second adder form the electrical equivalent of a second cylindrical ultrasonic lens having an axis which extends parallel to the firs. electrodes.

4,324,143

SINGLE PATH ADJUSTABLE FLOWMETER

Jerry A. Olson, Dearborn, Mich., assignor to Eaton Corporation, Cleveland, Ohio

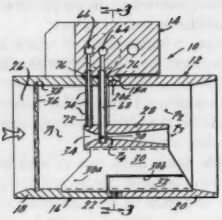
Filed Sep. 15, 1980, Ser. No. 187,294

Int. Cl.³ G01F 1/50, 1/32

U.S. Cl. 73—861.62 29 Claims

1. In a flowmeter of the type including a first set of swirl vanes for swirling a fluid in a passage to create a low pressure region at the center of said swirl, means for sensing said low pressure, and means for sensing the pressure of said fluid before said swirling, an improvement comprising:

a second set of swirl vanes coacting with said first set to form said swirl and operable for selective repositioning with



respect to said first set to effect a desired pressure to flow rate operating characteristic for said flowmeter.

4,324,144

TURBINE FLOWMETER

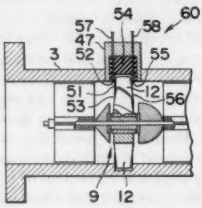
Yasuji Miyata, Yokohama, and Kazuhiko Hirose, Mitaka, both of Japan, assignors to Tokico, Ltd., Kanagawa, Japan

Filed Jan. 3, 1979, Ser. No. 798

Claims priority, application Japan, Jan. 20, 1978, 53-4851

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.77 **9 Claims**



1. A turbine flowmeter comprising

(a) cylindrical casing,

(b) a passage defined by an inner space of the casing for conducting a fluid to be measured,

(c) an impeller rotatably supported within the casing in the passage, said impeller having a rotator with a number of blades fixed on the outer surface of the rotator,

(d) guide members for guiding the fluid in the passage and disposed on the upstream side and downstream side of the impeller, respectively,

(e) an annular recess provided within the casing adjacent to the free end of a blade in the direction of rotation of the impeller, the free end portion of the blade being positioned in the annular recess, and

(f) a pair of electrode plates for detecting the rotation of the impeller as a change of electrostatic capacity, said electrode plates being fixed in the recess of the casing without projecting into the passage and being disposed in opposition to each other at a distance.

4,324,145

FLOWMETER HAVING A ROTARY BODY AND MEANS FOR IMPROVEMENT OF THE STARTING BEHAVIOR OF THE ROTARY BODY

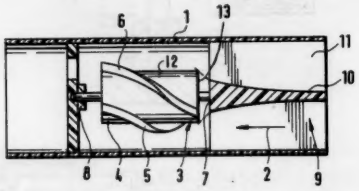
Karl-Heinz Werkmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 132,478

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911826

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.89 **6 Claims**



1. A flowmeter, comprising

a housing wall defining a flow channel therein adapted for flow therethrough,

a rotary body having at least one helical spiral on an outer periphery thereof,

means for rotatably supporting said rotary body in said flow channel,

a flow straightening blade disposed in said flow channel upstream of said rotary body, said flow straightening blade having walls oriented substantially in a direction of flow, and

said walls of said straightening blade thicken increasingly in a direction toward and up to said rotary body.

4,324,146

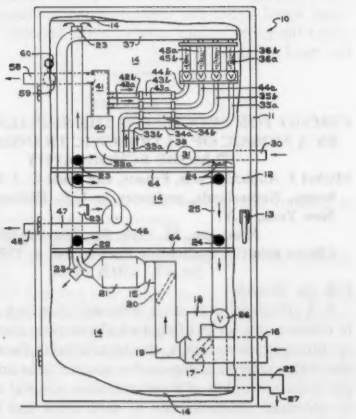
SAMPLING APPARATUS AND PROCESS

John W. Born, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1980, Ser. No. 192,122

Int. Cl.³ G01N *31/06*

U.S. Cl. 73—863.12 **6 Claims**



6. A process for collecting a sample of pollutant from a determinable quantity of ambient atmosphere and for simulta-

neously collecting a second sample of pollutant from an essentially equal quantity of ambient atmosphere plus a determinable quantity of the same pollutant which comprises:

a. flowing ambient atmosphere during a sampling time period at a known flow rate through a first collector device capable of releasably entrapping therein pollutant contained in said ambient atmosphere,

b. flowing ambient atmosphere during said sampling time period through a permeation chamber and introducing a determinable quantity of said pollutant into said ambient atmosphere flowing through said permeation chamber,

c. flowing a portion of the discharge flow from said permeation chamber during the said sampling time period at a rate essentially equal to the flow rate at which ambient atmosphere is travelling through the aforesaid first collector device through a second collector device capable of releasably entrapping therein said pollutant contained in the said discharge flow from said permeation chamber, and

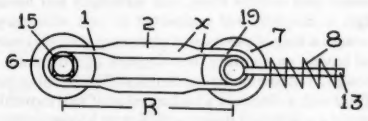
d. discontinuing the air flows through the said first collector device and second collector device at the end of the sampling time period.

4,324,147

VARIABLE CROSS SECTION V-BELT

Russell C. Crawford, III, 6991 Juana Dr., Millington, Tenn. 38053

Filed Mar. 11, 1980, Ser. No. 129,607
Int. Cl.³ F16H *19/04*; F16G *5/00*
U.S. Cl. 74—37 **3 Claims**



1. An endless V-belt comprising first portions and second portions,

each portion having a constant cross sectional area but the cross sectional area of said first portions being less than the cross sectional area of said second portions,

the length of each of said first portions being equal, and the length of each of said second portions being equal,

the sum of the lengths of said first and second portions being substantially equal to the circumference of the belt, and

said first and second portions alternating with each other and being connected together by relatively short transition portions of gradually tapering cross sectional area.

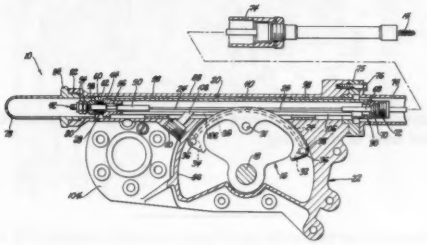
4,324,148

ROTARY/LINEAR MOTION CONVERTER ASSEMBLY (BOWSTRING)

Ants Sildve, Lansdale, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed May 19, 1980, Ser. No. 151,179
Int. Cl.³ F16H *21/44, 25/18*
U.S. Cl. 74—108 **12 Claims**

1. A rotary/linear motion converter assembly **(10)** of the type converting rotational motion to longitudinal motion for longitudinally moving a motion transmitting core element **(14)**, and vice versa, to transmit motion, said assembly comprising; sector means **(16)** rotatable about a rotational axis, slider means **(20)** reciprocal along a reciprocation axis which is transverse to said rotational axis, housing means **(22)** for rotatably supporting said sector means **(16)** and for reciprocally supporting said slider means **(20)**, tensioning means **(24, 26)** in tension between and interconnecting said sector means **(16)** and said slider means **(20)** to move said slider means **(20)** along said reciprocal axis in response to rotation of said sector means **(16)**, and vice versa, for preventing lost motion between said sector means **(16)** and said slider means **(20)**, first **(28)** and second **(30)** attachment means spaced along said reciprocation axis from one another, said tensioning means including a first cable **(24)** attached at a first end to said first attachment means **(28)** and a second cable **(26)** attached at a first end to said second attachment means **(30)** for placing said slider means **(20)** in compression between said first **(28)** and second **(30)** attachment means, said slider means **(20)** including a tubular member **(40)** having first and second ends, a guide means including a slot **(106)** extending longitudinally along said tubular member **(40)** and a guide member **(108)** supported by said housing **(22)** and extending into said slot **(106)** for preventing rotation of said slide means **(20)** about said reciprocation axis, said sector means **(16)** extending into said tubular member **(40)** through said slot



(106), said first attachment means **(28)** being positioned at said first end of said slider means **(20)** and said second attachment means **(30)** being positioned at said second end of said slider means **(20)**, said first attachment means **(28)** including adjustment means **(42)** for adjusting the tension in said first **(24)** and said second **(26)** cables and a first adapter **(44)** abutting said first end of said slider means **(20)** and a first terminal shaft **(50)** secured to said first end of said first cable **(24)** and extending through said first adapter **(44)**, said adjustment means **(42)** including a threaded portion **(52)** on said terminal shaft **(50)** and at least one nut **(54)** threaded on said threaded portion **(52)** for reacting with said first adapter **(44)**, said terminal shaft **(50)** including an irregularly shaped portion **(56)** coacting with said first adapter **(44)** for preventing rotation of said terminal shaft **(50)**.

4,324,149

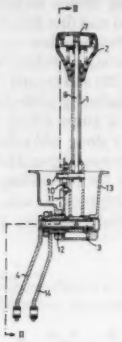
GEAR SHIFT NOT REQUIRING ADJUSTMENT

Nils L. Johansson, Askim, and Stig H. A. Weiertz, Kungalv, both of Sweden, assignors to AB Volvo, Gothenberg, Sweden

Filed Sep. 18, 1979, Ser. No. 76,748
Claims priority, application Sweden, Sep. 28, 1978, 7810181
Int. Cl.³ G05G *5/18, 7/16, 9/18*
U.S. Cl. 74—473 R **2 Claims**

1. In a gear selector mechanism for automatic transmissions with a gear lever connected to a gearbox within a gearbox housing and movable in a selector gating for setting the correct gear position, in which the gear lever is connected to the gearbox via a connecting lever and a control rod, which is connected to a gear selector in the gearbox, and in which the gear lever is fixed to a shaft which is rotatably mounted relative to the car body; the improvement in which the selector gating is journalled around the same axis as the gear lever and

is connected to the gearbox housing via a connecting lever and a reaction rod affixed to the gearbox housing, said connecting



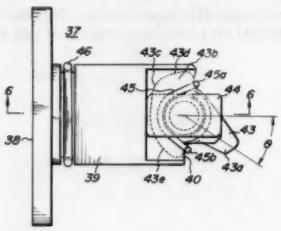
lever of the gear lever being of the same length as the connecting lever of the gating.

4,324,150

MECHANISM FOR PREVENTING MISSELECTION OF REVERSE GEAR

Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 23, 1980, Ser. No. 114,603
Claims priority, application Japan, Jan. 30, 1979, 54/9869
Int. Cl.[3] F16H 57/06
U.S. Cl. 74—476 3 Claims



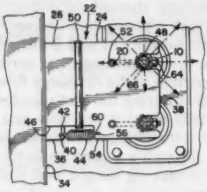
1. A mechanism for preventing a control lever from misselecting reverse gear in a transmission in which a forward running gear shift position is aligned on a same shift control line with a reverse gear shift position of the control lever, an improvement comprising a plug arranged at a mounting portion of the control lever, and a cam pivotally supported by a pin to freely rotate on supporting plates projecting from the top and of said plug and having a coil spring pivoted on said pin so as to urge a projecting portion of the cam against an end portion of the control lever, the cam further provided with a rotation limiting portion at an end remote from the projecting portion, wherein when the control lever is moved from a forward running gear shift position said cam is rotated by the control lever to cause said rotation limiting portion to abut against said plug in order to prevent the control lever from being put into the reverse gear shift position by moving on a linear shift control line.

4,324,151

FOUR QUADRANT CONTROL LEVER RESTRAINT

Douglas W. Rudy, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed May 12, 1980, Ser. No. 148,647
Int. Cl.[3] G05G 5/06
U.S. Cl. 74—532 7 Claims



1. In a vehicle having a hydraulic working circuit and a control for adjusting flow through said circuit the improvement comprising:

a control lever operable in a plurality of quadrants, said control lever having a bore provided therethrough transverse to the longitudinal axis of said control lever;

a rod having an upwardly extending end portion, said rod positioned into said bore of said control lever and projecting forwardly from said control lever;

a hinged plate having a mounting plate surface and a stationary leaf extending from said mounting plate surface toward said control lever, said stationary leaf having an edge, a movable leaf connected to said stationary leaf through a hinged pin on said stationary leaf, said movable leaf having an aperture therethrough of a diameter large enough to accommodate said upwardly extending portion of said rod, a cutout at a leading edge of said movable leaf having a width and depth sufficient to accommodate said control lever and an appendage provided with an aperture therethrough;

a projecting tab extending forward from said mounting plate surface toward said control lever, said projecting tab having an aperture outboard of a vertical plane corresponding to said edge of said stationary leaf, said aperture of said projecting tab aligned in the same vertical plane as said aperture in said appendage of said movable leaf;

a spring having a first end connected through said aperture of said projecting tab and a second end connected through said aperture of said appendage of said movable leaf.

4,324,152

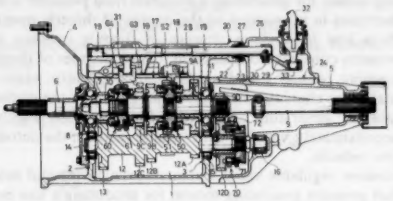
SEALING DEVICE FOR A MANUAL TRANSMISSION FOR AN AUTOMOBILE

Syoiti Oshima, and Shuichiro Ida, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1980, Ser. No. 162,835
Claims priority, application Japan, Mar. 26, 1980, 55-40795[U]
Int. Cl.[3] F16H 57/02; B60K 17/34; G05G 9/16
U.S. Cl. 74—606 R 7 Claims

1. In combination with a manual transmission for an automobile having a transmission case, an extension housing, a case cover mounted to said transmission case for covering the upper open portion thereof, a shift lever retainer shiftably and selectively supporting a shift lever and mounted on the upper surface of said extension housing and a shift lever shaft extending along said case cover and said shift lever retainer for transmitting operation of said shift lever to said transmission, a sealing device provided between said case cover and said shift lever retainer, said device comprising cylindrical connecting portions respectively formed in said case cover and said shift lever

retainer and penetrated by said shift lever shaft for being connected with each other by insertion with interposition of a



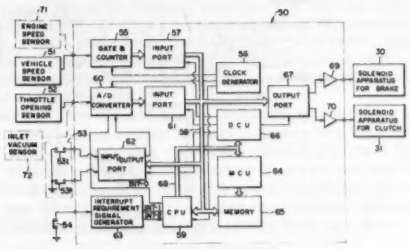
sealing member between the inner periphery of one of said connecting portions and the outer periphery of the other.

4,324,153

METHOD FOR DRIVER-DEPENDENT SHIFT CONTROL OF A VEHICLE SUB-TRANSMISSION WHICH MAXIMIZES FUEL ECONOMY

Hiroshi Sugimoto, Aichi; Jiro Nakano, Okazaki, and Noritaka Yanagihara, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 24, 1979, Ser. No. 60,129
Claims priority, application Japan, Dec. 4, 1978, 53-150348
Int. Cl.³ B60K *41/06, 41/10*
U.S. Cl. 74—866 **8 Claims**



1. A shift control method for a sub-transmission of a vehicle which is also equipped with a manual transmission operated by a driver, said method comprising the steps, in order, of:

detecting said driver's shifting of said manual transmission at a certain gearing ratio;

measuring a value of a parameter related to vehicle speed and a value for throttle opening at said driver's shift point of the manual transmission set to said certain gearing ratio;

determining, on the basis of said certain gear ratio and of said measured parameter values, a driver-determined sub-transmission shift line for said gearing ratio of the manual transmission, said shift line indicating the relationship between said parameter related to the vehicle speed and said throttle opening when said sub-transmission is to be shifted;

performing, for a first time period, shift control of the sub-transmission in accordance with said driver-determined sub-transmission shift line, while the manual transmission is set to said gearing ratio;

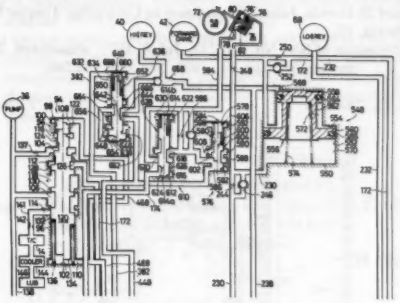
and performing, for a second time period which directly follows the first time period, shift control of the sub-transmission in accordance with a standard prdetermined shift line, said standard predetermined shift line providing a relationship between vehicle speed and throttle opening along which said sub-transmission is shifted to provide substantially optimum fuel economy, said shift control for a second period being performed while the manual transmission is set to said gearing ratio.

4,324,154

HYDRAULIC CONTROL SYSTEM OF AUTOMATIC POWER TRANSMISSION

Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 2, 1978, Ser. No. 947,423
Claims priority, application Japan, Sep. 29, 1978, 53-120980
Int. Cl.³ B60K *41/06, 41/10*
U.S. Cl. 74—869 **18 Claims**



1. A hydraulic control system for an automatic power transmission mechanism including a driving member operatively connected to the input shaft of an engine of an automotive vehicle, the engine having a throttle which opens in degrees, a driven member, and frictional units respectively having fluid operated actuating means which are to be selectively made operative and inoperative for producing a plurality of gear ratios between the driving and driven members, comprising:

throttle pressure generating means for producing a throttle pressure which is proportional to the degree of throttle opening over most of the throttle opening range,

modified throttle pressure generating means for producing a modified fluid pressure which increases in proportion to the degree of throttle opening from low to medium degrees of throttle opening and remains constant from medium to high degrees of throttle opening, whereby said modified fluid pressure approximates the characteristics of torque output of the engine,

governor pressure generating means for producing a governor pressure variable with vehicle speed of the automotive vehicle,

modulated throttle pressure generating means for producing a modulated throttle pressure which remains constant from low to medium degrees of throttle opening and increases in proportion to the degree of throttle opening from medium to high degrees of throttle opening,

pressure regulator valve means communicating with said modified pressure generating means for producing a line pressure variable with said modified fluid pressure,

gear position selector valve means provided operatively between said pressure regulator valve means and the respective actuating means of said frictional units and having a plurality of conditions for providing communication between the pressure regulator valve means and the actuating means of selected ones of said frictional units,

gear shift valve means provided operatively between said gear position selector valve means and the actuating means of at least one of said frictional units and responsive to said governor pressure for being operative to provide communication between said gear position selector valve means and the actuating means of said at least one of the frictional units, and

pressure reducing valve means provided operatively between the actuating means of said at least one of the frictional units and said gear position selector valve means and having a condition providing communication therebetween through

said gear shift valve means, the pressure reducing valve means being responsive to said throttle pressure for producing, in the presence of a fluid pressure developed on an opposite side the pressure reducing valve means to the actuating means of said at least one of the frictional units, a fluid pressure which is not higher than said line pressure by a value variable with said throttle pressure.

4,324,155

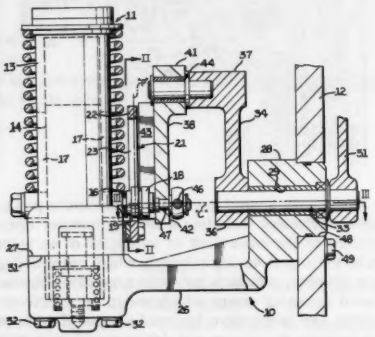
MOUNTING ASSEMBLY FOR A CONTROL ACTUATOR

Robert D. Dorris, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 814,233, Jul. 8, 1977, abandoned. This application Apr. 21, 1980, Ser. No. 142,566

Int. Cl.³ F16H *35/08*

U.S. Cl. 74—834 **7 Claims**



1. A mounting assembly for mounting a control actuator and its associated control linkage to a wall having an aperture extending therethrough, said control actuator having a control actuator shaft moveable between first and second positions along a linear pathway perpendicular to the axis of the control actuator shaft, said control linkage having an input shaft linked to the control actuator shaft, said mounting assembly comprising:

a mounting bracket having a mounting surface on which the control actuator is mounted, a wall mounting portion for mounting the mounting bracket at the aperture in the wall, and a bore in the wall mounting portion, said input shaft being rotatably positioned within the bore and extending through the aperture, said bore and hence said input shaft having an axis intersecting the linear pathway of the control actuator shaft.

4,324,156

METHOD AND APPARATUS FOR HYDRAULIC CONTROL OF AUTOMATIC TRANSMISSION

Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 947,423, Oct. 2, 1978. This application Mar. 21, 1979, Ser. No. 22,538

Claims priority, application Japan, Sep. 29, 1978, 53-120980

Int. Cl.³ B60K *41/06, 41/10*

U.S. Cl. 74—869 **53 Claims**

1. A hydraulic control system for an automatic power transmission mechanism including a driving member operatively connected to the input shaft of an engine of an automotive vehicle, which engine has a throttle which opens in degrees, a driven member, and frictional units each having fluid operated actuating means which are selectively operative and inoperative for producing a plurality of gear ratios between driving and driven members, comprising:

means for generating a throttle fluid pressure which is proportional to the degree of throttle opening over most of the throttle opening range,

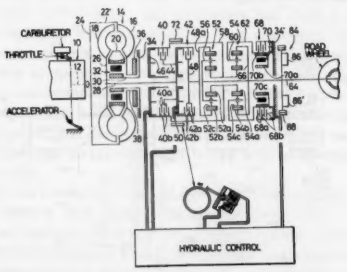
means, communicating with said throttle pressure generating means, for generating a modified fluid pressure which increases in proportion to the degree of throttle opening from low to medium degrees of throttle opening and remains constant from medium to high degrees of throttle opening, whereby said modified fluid pressure approximates the characteristics of torque output of the engine,

means for generating a governor fluid pressure which is approximately variable with vehicle speed of the automotive vehicle,

a pressure regulator valve, communicating with said modified pressure generating means, for producing a line pressure varible with said modified throttle fluid pressure, said line pressure being always greater than said modified throttle pressure,

means, communicating with said throttle pressure generating means and with said pressure regulator valve, for generating a modulated throttle pressure which remains constant from low to medium degrees of throttle opening and increases in proportion to the degree of throttle opening and increases in proportion to the degree of throttle opening from medium to high degrees of throttle opening,

a gear position selector valve provided operatively between said pressure regulator valve and the respective actuating means of said frictional units, said gear position selector valve having a valve member movable between a plurality



of positions for providing communication between the pressure regulator valve and the actuating means of at least one of the frictional units,

a gear shift valve provided operatively between said gear position selector valve and the actuating means of at least one of the frictional units and connected for communication with said governor pressure and modulated throttle pressure generating means and responsive to said governor pressure and said modulated throttle pressure to provide communication between said gear position selector valve means and the actuating means of the another frictional unit, and

a pressure reducing valve provided operatively between the actuating means of the one frictional unit and said gear position selector valve, said pressure reducing valve having a valve member movable into a position providing communication between the one frictional unit and said gear position selector valve through said gear shift valve, the pressure reducing valve being connected with said throttle pressure generating means and being responsive to said throttle pressure for producing a fluid pressure which is not higher than said line pressure by a value variable with said throttle pressure, said valve member of said pressure reducing valve including a first pressure acting area which is selectively exposed to the same fluid pressure to which another frictional unit is selectively exposed and a second pressure acting area, opposite to

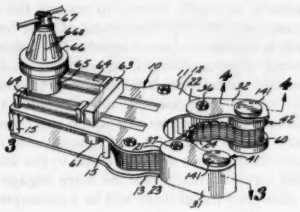
said first pressure acting area, which is selectively exposed to said throttle pressure.

4,324,157

DRILL PIPE CLAMP

Michael D. Soutsos, 5475 Colorado St., Long Beach, Calif. 90814

Filed Jan. 28, 1980, Ser. No. 115,911
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.17 1 Claim



1. In a clamp assembly for use in manipulating drill pipes including a frame having an upper and lower plate joined together across a plurality of spacers to form a gap therebetween, a pair of pivotal jaws pivotally attached to one end of said frame and disposed for pivotal motion in a plane substantially parallel with said upper and lower plates; a plurality of first sprockets mounted for rotation within said gap, a plurality of second sprockets mounted for rotation at the free ends of said jaws, each said second sprocket including an enlarged ball race assembly at the upper and lower ends thereof and a sheave chain loop disposed around said first and second sprockets and aligned to pass between said ball race assemblies, the improvement comprising:

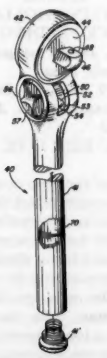
said ball race assemblies each including opposed fixed and rotary mating circular surfaces each provided with a ball groove for retaining roller balls therebetween, said fixed surfaces being releasably attached to said pivotal jaws and said rotary surfaces being attached to said second sprockets whereby the release of said fixed surfaces allow for withdrawal of said second sprockets from said jaws.

4,324,158

ILLUMINATED WRENCH

Alfred N. Le Roy, 1219 Towpath La., Wilmington, Ill. 60481

Filed Jul. 14, 1980, Ser. No. 168,582
Int. Cl.³ B25B 13/46
U.S. Cl. 81—60 4 Claims



1. A wrench for rotating a socket or the like having a body with an elongated handle and a head at one end, said head receiving a rotatable drive member having a drive projection, a ratchet operably connectable to said rotatable drive for reversible operation thereof, the improvement therein comprising:

(a) said handle defining a battery receiving chamber for receipt of at least one battery cell;

(b) said body defining a bore generally disposed transversely to the axis of said handle;

(c) said body defining an aperture and intersecting said bore;

(d) a socket member rotatably disposed in said bore and adapted to receive a light bulb; and

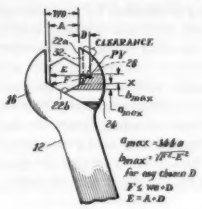
(e) circuit means operably connecting said socket and said battery chamber whereby said bulb can be selectively energized and said socket member rotated to direct light through said aperture to focus at a predetermined work area.

4,324,159

OPEN END RATCHET WRENCH

Edward J. Wrobbel, 49 Williamsburg Dr., Fairport, N.Y. 14450

Filed Jun. 23, 1980, Ser. No. 161,842
Int. Cl.³ B25B 13/28
U.S. Cl. 81—111 27 Claims



1. A one-way open-end wrench comprising first and second jaws with opposing faces spaced from each other to define an opening which receives an item having adjacent flats to be turned, said first jaw being rotatable about a pivot with respect to said second jaw in opposite directions to close and maintain closed said opening and engage and drive said item when turned one way and to open said opening and turn freely about said item and then close said opening when turned the opposite way, and means locating said pivot for providing the sum of the moments of the forces on said first jaw about said pivot when said wrench is turned said one way is in the direction to rotate the first jaw to close said opening and maintain said opening closed and when said wrench is turned in the opposite way between adjacent ones of said flats, the sum of the moments of the forces on said first jaw is in the direction to open and then close said opening.

4,324,160

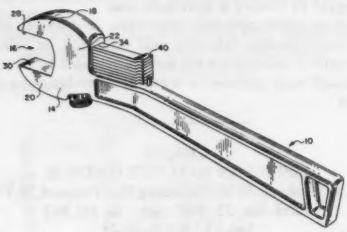
ADJUSTABLE WRENCH

G. Jordan Maclay, 847 W. Newport, Chicago, Ill. 60657

Continuation-in-part of Ser. No. 956,871, Nov. 1, 1978, Pat. No. 4,237,756. This application Dec. 8, 1980, Ser. No. 213,870
The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.
Int. Cl.³ B25B 13/58
U.S. Cl. 81—185 22 Claims

1. In an open-ended wrench of the type including a manually graspable handle and a nut-seizing jaw formation connected to said handle, said jaw formation having a nut-receiving opening therein defined between an upper jaw member, a lower jaw member spaced a fixed distance from the upper jaw member and a jaw back portion extending between the upper and lower jaw members, a slot communicating with said opening and

extending through said jaw back portion, a plurality of substantially equal length shims longitudinally slidable through said slot from a location outside of said opening to a location inside of said opening to provide a variable dimension for said nut-receiving opening, said plurality of shims comprising interlock means for preventing any shim from being located inside of said opening unless there is supportive contact with said jaw; said interlock means comprising projecting means carried by each of said shims and means on each said shim for receiving the projecting means of an underlying shim; and said plurality



of shims being positioned for sequentially varying said nut-receiving opening dimension by longitudinally moving one or more of said shims into said opening with said shims that are moved into said opening being in supportive contact with said jaw, the improvement comprising each said shim having one end thereof formed with an offset end portion including an inclined section extending angularly from the plane of the shim and an end section extending from the inclined section, said offset end portion defining said projecting means on one side thereof and said means for receiving the projecting means of an underlying shim on the other side thereof.

4,324,161

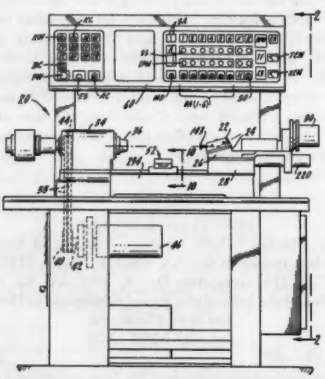
AUTOMATIC TURRET LATHE

Adolph V. Klancnik, Glenview, and Kenneth A. Klancnik, Palatine, both of Ill., assignors to Universal Automatic Corporation, Des Plaines, Ill.

Filed Jul. 25, 1979, Ser. No. 60,790

Int. Cl.[3] B23B *3/18, 7/04*

U.S. Cl. 82—2 R **9 Claims**



1. In an automatic turret lathe in which a turret having different faces each for supporting a tool is supported for rotary indexing movement on a reciprocal slide and in which the slide is supported for approach movement toward a workpiece, held by a reversible rotary spindle, and return movement to home position, the lathe including means to index the turret after the slide is in home position, the slide being reciprocated by a variable speed reversible motor adapted to advance the slide at rapid approach speed until the tool engages the workpiece, whereafter the slide is to be advanced at slow feed speed until the depth of cut is attained, and wherein the motor is reversed by a substantial rise in current:

an automatic sequencer unit attached to the slide to move axially therewith in both the tool approach and tool return direction, means to index the sequencer unit to different positions corresponding to the turret positions, said sequencer unit having at the different sequencer index positions a track for retaining variantly positionable metallic indicium settable manually therein to control the end of rapid approach and the commencement of slow feed;

proximity switch oscillator control sensors for sensing said indicium when indexed thereto, respectively to change the speed of said motor from rapid approach to slow feed;

said sequencer unit at each operable index position thereof including means supporting an extendible and retractable stop movable axially therewith and spaced from a fixed stop opposed thereto by a distance equal to the total distance of tool travel so that when the stops engage at the end of the slow feed travel there will be a consequent rise in motor current to reverse the motor

and a safety switch between the stops to be actuated by the first-named stop and causing the motor to stop upon concurrent failure to sense positioning of the first-named indicium.

5. In an automatic turret lathe in which a turret slide is indexable from one position to another and in which the turret slide is normally advanced and retracted rapidly and at feed speeds, relative to a workpiece rotated by a spindle, by a reversible variable speed motor turret indexing means; a sequencer which indexes with the turret, said sequencer being equipped with manually settable indicia:

(a) slow feed of the turret slide after the tool is presented to the workpiece regardless of the kind of tool;

(b) slow withdrawal of the turret slide when tapping or boring; and

(c) reverse spindle motion after or before completing a tap depending on whether the tap is right hand or left hand;

proximity switch oscillator control sensors for sensing said indicium when indexed thereto;

said lathe for each tool position having on the turret slide a manually adjustable stop screw indexible with said turret and opposed to a fixed stop to determine the depth of cut when drilling or boring and a switch between the stops to be actuated by the advancing adjustable screw to stop the motor upon failure of the related proximity switch sensor to sense an indicium corresponding to (a) for the corresponding tool position.

4,324,162

MACHINE TOOL HAVING HOLLOW MAIN SPINDLE AND BAR STOCK FEEDING MECHANISM

Sukehiro Uehara, Ueda, Japan, assignor to Kabushiki Kaisha Miyano Tekkosho, Ueda, Japan

Filed Jun. 9, 1980, Ser. No. 157,753

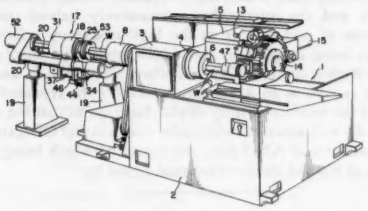
Claims priority, application Japan, Jun. 22, 1979, 54-78826; Nov. 24, 1979, 54-152283

Int. Cl.[3] B23B *13/02, 13/08*

U.S. Cl. 82—2.5 **6 Claims**

1. In a machine tool of the type comprising a hollow main spindle having therein a main chuck for gripping a bar stock and confronting at a front end thereof a machining zone, a bar stock feeding mechanism having a rotatable feed chuck for gripping the bar stock and being disposed to the rear of the main spindle to feed intermittently the forward leading end of the bar stock through the main spindle and the main chuck, which is in a loosened state, from the rear thereof for every cycle of machining, and a tool support structure supported on feed slides and having tools mounted thereon for machining the bar stock, said tool support structure being so disposed that a selected tool mounted thereon can be brought into said ma-

chining zone to carry out the machining; the improvement which comprises a bar end support mounted on the tool support structure in a manner permitting the bar end support to rotate freely about the centerline axis of the main spindle, first means for moving said feed slides and the tool support structure, at the start of each intermittent feeding movement of the bar stock feeding mechanism so as to cause said bar end support to abuttingly engage and support the forward leading end of the bar stock in a manner to hold the bar stock coaxially with the main spindle between said rotatable feed chuck of the



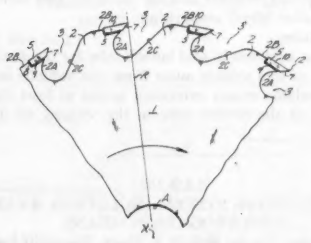
bar stock feeding mechanism and the rotatable bar end support, and second means for moving said feed slides along the centerline axis of the main spindle through a distance corresponding to a unit distance of feed of the bar stock by said bar stock feeding mechanism as the mechanism is operated for feeding, thereby to cause the bar end support to continue to support rotatingly the end of the bar stock and bring the stock fully into position for machining in the machining zone, irrespective of the rotation of the main spindle, whereby the cyclic bar feeding and machining operation can be continuously carried out without stopping the main spindle.

4,324,163

CIRCULAR SAW CONSTRUCTION

Donald R. LaVelle, 2425 Whiteaker, Cottage Grove, Oreg. 97424

Filed May 19, 1980, Ser. No. 150,640
Int. Cl.³ B27B *33/12*
U.S. Cl. 83—855 **12 Claims**



1. A circular saw blade comprising,

a saw blade having shoulder portions spaced about the saw perimeter defining open gullet areas therebetween, and

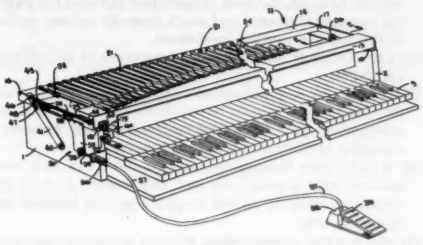
saw teeth of block shape one each in place on one of said shoulder portions, said teeth each having a major axis substantially normal to an intersecting saw blade radius whereby load forces are imparted along vectors generally orientated lengthwise of each tooth, said teeth each having a beveled front face defining an included angle of between forty and fifty degrees with a tooth intersecting saw blade radius.

4,324,164

TONE CHANGING MEANS FOR PERCUSSION INSTRUMENTS

Charles Monte, 570 Texas St., San Francisco, Calif. 94107, and Barry E. Carter, 2514-32nd Ave., San Francisco, Calif. 94116

Filed Dec. 30, 1977, Ser. No. 865,960
Int. Cl.³ G10F *1/02*; G10H *3/00*
U.S. Cl. 84—1.04 **8 Claims**



1. In a piano having a tone generator assembly and percussion means for generating tones on said assembly,

a support for the tone generator assembly,

mounting means for shiftably supporting said tone generator assembly on said support relatively to said percussion means,

and manipulatable means connected to said mounting means for selectively shifting said assembly relatively to said percussion means at will thereby to alter the tone generated by the tone generators in said assembly,

said mounting means including

a pivotal connection between one end of said assembly and said support,

the other end of said assembly being shiftable about said pivotal connection

and resiliently yieldable means for urging said assembly into an initial playing position,

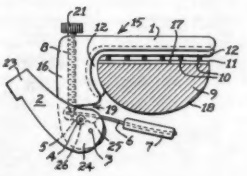
said assembly having a treble end and a bass end and said pivotal connection being at the treble end.

4,324,165

CAPO

James W. Wilkerson, Highway 64 East, Savannah, Tenn. 38372

Filed Mar. 6, 1980, Ser. No. 127,868
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—318 **6 Claims**



1. A capo for attachment to the neck of a stringed musical instrument, said neck having a longitudinal axis, opposite sides, a fret board and a bottom surface, transverse frets disposed on said fret board and a plurality of strings disposed parallel to said longitudinal axis, comprising:

(a) a frame,

(b) an elongated top pressure bar projecting from said frame and adapted to extend transversely of said longitudinal axis over the fret board of a stringed musical instrument and to engage the strings of the instrument when said

frame is located along one side of said neck in operative position,

(c) an elongated mounting arm having a remote end portion comprising a bottom pressure bar, a proximal end portion, and an elongated, semi-elastic, intermediate portion extending between said bottom pressure bar and said proximal end portion,

(d) means pivotally mounting said proximal end portion on said frame to support said bottom pressure bar transversely beneath the neck in operative position for swinging movement toward and away from the bottom surface of the stringed musical instrument,

(e) a manual lever having a handle portion and an operative end portion,

(f) means journaling said operative end portion on said frame for swinging movement of said lever about a pivotal axis substantially parallel to said longitudinal axis, between a clamping position and a release position,

(g) a transverse bearing member mounted on said lever between said pivotal axis and said handle portion and projecting parallel to said longitudinal axis beneath said mounting arm,

(h) said bearing member being adapted to engage said semi-elastic intermediate portion and to cause said bottom pressure bar to swing toward and engage the bottom surface of the stringed musical instrument when said frame is in operative position and said lever is moving toward said clamping position, and to cause said bottom pressure bar to move away from the bottom surface of the neck when said lever is moving toward said release position.

4,324,166

TUNING DEVICE FOR MUSICAL INSTRUMENTS

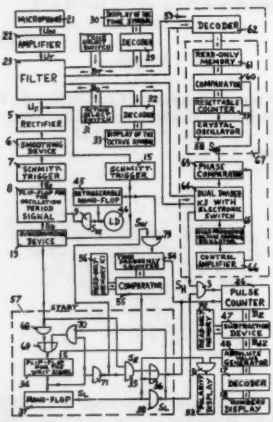
Reiner Foerst, Gummersbach, Fed. Rep. of Germany, assignor to Dr.-Ing. Reiner Foerst GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,435

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904912

Int. Cl.³ G10G *7/02*

U.S. Cl. 84—454 **1 Claim**



1. A tuning device for musical instruments comprising in combination a high frequency oscillator having a frequency controlled by a tone select switch and an octave select switch and the output S_H of which is supplied to the input of an AND-gate, the output of which is supplied to the display device for the tone pitch and the other input of which is connected to the output of a reference time signal generator which comprises a flip-flop for a wait signal S_W and which is started by the amplitude of the tone via a microphone, an amplifier, a filter, a smoothing device and a Schmitt-trigger, and which is stopped after the counting of a definite number of tone oscillations filtered and converted, said high frequency reference oscillator comprising a low frequency 12-tone generator, which is addressable via a decoder by the tone select switch, a high frequency voltage controlled oscillator for the generation of the output signal S_H, a dual divider, and a phase comparator for the comparison of the output signal of said divider to the output signal S_N of said low frequency 12-tone generator, the output signal of said comparator reacting via a control amplifier on the frequency of said high frequency voltage controlled oscillator and the intermediate successively halved output frequencies of said divider as the high frequency reference signal S_H being supplied to said AND-gate via an electronic switch which is controlled by said octave select switch, and an OR-gate as well as an AND-gate which for the repeated enabling of the numbers-display device function so that the flip-flop for the wait signal is additionally reset via said OR-gate by the output of said AND-gate, the inputs of which being the wait signal S_W and the inverted read signal S_L.

4,324,167

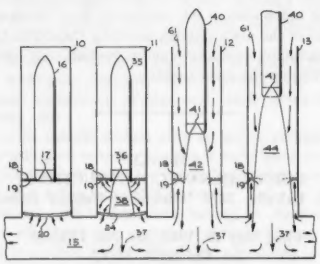
FLEXIBLE AREA LAUNCH TUBE REAR COVER

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 14, 1980, Ser. No. 139,629

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.8 **17 Claims**



1. An apparatus for sealing a portion of a launch tube for exhaust-propelled vehicles and for allowing free flow of exhaust gases after lift-off comprising:

a launch tube;

duct means adjacent to said launch tube for conducting the exhaust of said vehicle away from said vehicle; and

flexible sealable means extending across at least the open portion of the launch tube in the vicinity of the duct means.

4,324,168

WEAPON FIRING SYSTEM INCLUDING WEAPON INTERROGATION MEANS

Frank M. Sano, Wayne; Robert A. Sliwa, Woodcliff Lake, and Edward J. Golden, Harryston Township, Sussex County, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 26, 1980, Ser. No. 191,642

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.814 **9 Claims**

1. A weapon firing system including weapon interrogation means, comprising:

a plurality of weapons each of which has an electrical igniter;

switching means;

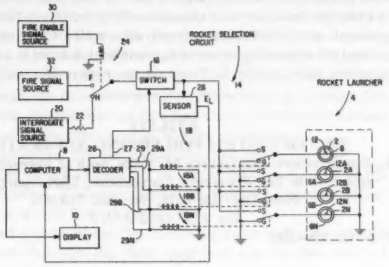
a plurality of switching devices connected to corresponding electrical igniters;

means for providing a weapon interrogate signal connected to the switching means and applying said signal thereto;

means for providing connecting signals and for applying said signals to the switching devices for independently connecting said devices to the switching means;

operating means connected to the switching means for rendering said means operative to apply the interrogate signal to an independently connected switching device and therethrough to a corresponding igniter for interrogating the availability of a weapon ready to fire;

a sensor connected to the switching means and connected through the independently connected switching device to the corresponding igniter for sensing the impedance



thereof provided in response to the applied interrogate signal, said impedance being indicative of the availability of a weapon ready to fire;

means for providing a weapon firing signal;

means operative for disconnecting the switching means from the weapon interrogate signal means and for connecting said switching means to the weapon firing signal means, whereupon the firing signal is applied to the switching means; and

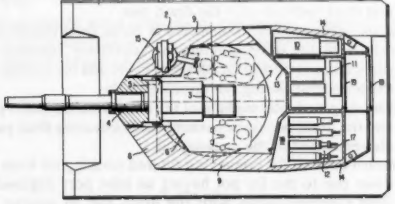
the operating means rendering the switching means operative to apply the firing signal to an independently connected switching device and therethrough to the igniter for firing a corresponding weapon.

4,324,169

MAIN BATTLETANK TURRET

Gottlieb Rüttgerodt, Kassel, Fed. Rep. of Germany, assignor to Wegmann U. Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Nov. 19, 1976, Ser. No. 744,947
Int. Cl.³ F41H *5/20, 7/08*
U.S. Cl. 89—36 L **2 Claims**



1. A battletank turret having a relatively heavily armored space for the weapons system and for the crew of the battletank and a relatively lightly armored space for the power supply installations of the battletank and for the ammunition for the weapons system,

said relatively lightly armored space being located rearwardly of said relatively heavily armored space and being divided into a plurality of subspaces each individually accessible from the outside of the battletank, one of said subspaces including means to store ammunition for the weapons system in a manner such that the warheads are directed away from said relatively heavily armored space;

means for ventilating said relatively heavily armored space separately from said relatively lightly armored space to reduce degradation of the atmosphere in the relatively heavily armored space as a result of heat and vapors from fuel, lubricants, and the like,

the armor for said relatively heavily armored space containing a void sufficient to house sighting and observation equipment; and,

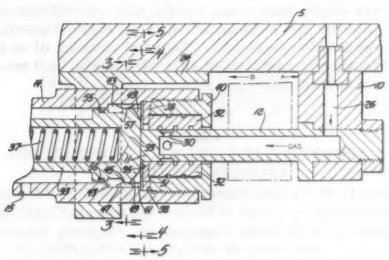
means for mounting sighting and observation equipment in the void in said armor.

4,324,170

RESIDUE-ACCOMMODATION MEANS FOR A GAS-OPERATED GUN

James J. Healy, Laguna Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1979, Ser. No. 108,446
Int. Cl.³ F41D *5/12*
U.S. Cl. 89—159 **4 Claims**



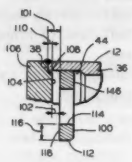
1. In a recoil-operated gun having a bolt-operating means that includes a gas cylinder, a piston slidably disposed within the cylinder, a gas tube connected with the gun barrel and projecting through an end wall **(39)** of the cylinder to deliver pressurized combustion gases to an end surface **(95)** of the piston for moving said piston along the cylinder to operate the bolt, and a sealing means **(55)** carried by the piston in sliding engagement with the cylinder side wall: the improvement comprising annular pocket means in the cylinder side wall near its juncture with the cylinder end wall; a first set of grooves **(49)** in the piston end surface, and a second set of grooves **(51)** in the cylinder end wall; the grooves in each set radiating outwardly from a central portion of the piston-end wall interface, whereby pressurized gases are enabled to flow through the grooves into the annular pocket means; the grooves in the first set communicating with the grooves in the second set when the piston has its end surface engaged with the cylinder end wall; the total area of the grooves being an appreciable percentage of the piston-end wall interface area, to significantly reduce bonding tendencies between the piston end surface and cylinder end wall; the aforementioned annular pocket means having sufficient volumetric capacity to receive and store a significant quantity of residue associated with the combustion gases.

4,324,171

FLUID DEVICE AND METHOD FOR MAKING

Richard P. Gaylord, St. Joseph, Mich., and Wendell E. Miller, Warsaw, Ind., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 916,376, Jun. 16, 1978, Pat. No. 4,187,766.
This application Jul. 9, 1979, Ser. No. 55,652
Int. Cl.[3] F16J 11/02, 15/18
U.S. Cl. 92—169 17 Claims



1. A tube and end element assembly for a fluid device which tube and end element assembly comprises an end element having an inner end and an outer end;

a cylindrical tube having first and second ends, having a first inside diameter portion that is proximal to said first end, and being joined to said end element by a bonded joint with said first end disposed proximal to said inner end; and

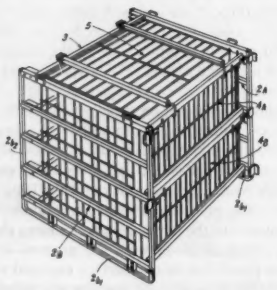
means comprising a stressing member that is separate from said end element, that is substantially circular, that is larger than said first inside diameter portion, and that is inserted into said first inside diameter portion proximal to said first end, for mechanically inducing an elastic diametral tensile strain in said tube proximal to said bonded joint and intermediate of said bonded joint and said second end; whereby said mechanically-induced elastic diametral tensile strain reduces cyclic diametral straining of said tube proximal to said bonded joint when cyclic fluid pressures are applied inside said tube.

4,324,172

APPARATUS FOR TREATING WINE BY THE CHAMPAGNE METHOD

Claude O. E. Cazals, Marne, and Jacques H. C. M. DuCoin, Mareuil-sur-Ay, both of France, assignors to Centre de Diffusion de la Methode Champenoise, Magenta, France

Filed May 14, 1980, Ser. No. 149,672
Claims priority, application France, May 16, 1979, 79 12443; Jul. 12, 1979, 79 18104
Int. Cl.[3] C12H 1/22
U.S. Cl. 99—277.1 4 Claims



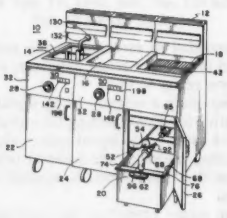
1. Apparatus permitting wine to be treated in bottles according to the champagne method comprising a rack in the form of a rectangular parallelepiped open on one face which is opposite to a base and provided with support elements for the corks of a layer of bottles which completely fill the rack, in some case with several other layers of bottles superposed and supported one on the other, said rack comprising two series of feet or runners placed along perpendicular walls of the rack and permitting the rack to be placed in a first position where the bottles are horizontal and a second position perpendicular to the first where the bottles are vertical with their necks directed downwardly, and being characterized in that lateral walls of the rack perpendicular to its base are provided towards the interior of the rack with rails disposed perpendicularly to the base of the rack to guide bottles in horizontal position introduced into the rack through an open face thereof and to assure the proper positioning of the bottles placed against said lateral walls, wherein one of said lateral walls is mounted in removable fashion, to enable at least a part of that wall to be moved in order to facilitate the extraction of the bottles in the vertical position, and wherein the removable wall of the rack comprises two separately removable parts which meet in a horizontal plane substantially halfway up the removable wall.

4,324,173

FILTER SYSTEM FOR FRYING APPARATUS

L. Frank Moore, and George M. Price, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Filed Dec. 23, 1976, Ser. No. 753,936
Int. Cl.[3] A47J 37/12
U.S. Cl. 99—330 7 Claims



1. In frying apparatus of the type including a fry pot for containing a pool of cooking oil and means for heating the oil to cook a portion of food during a cooking cycle, the combination with the frying apparatus of a filter system operable during a cleaning cycle for removing food particles which cling to the fry pot and for removing food particles suspended in the cooking oil, the filter system comprising:

a drain pan;

a drain conduit for conveying cooking oil and food particles entrained therein from the fry pot to the drain pan haing an inlet port connected in fluid communication with the fry pot and an outlet port for discharging the cooking oil and food particles into the drain pan;

a drain valve operably connected in series fluid circuit relation with the drain conduit for selectively opening the drain conduit during the cleaning cycle and for closing the drain conduit during the cooking cycle;

a filter disposed intermediate of the drain conduit outlet port and the drain pan for separating and collecting food particles entrained in the cooking oil;

a return conduit for conveying filtered cooking oil from the drain pan to the fry pot having an inlet port disposed in fluid communication with the drain pan to receive the cooking oil after it passes through the filter and having an outlet port for discharging the filtered cooking oil into the fry pot;

a pump connected in series fluid circuit relation with the return conduit for drawing the filtered cooking oil from the drain pan and for forcing it through the return conduit at a predetermined discharge pressure; and,

a shower fixture having an inlet port removably connected to the return conduit for receiving filtered cooking oil

from the pump, the shower fixture including a tubular member having side sections which are laterally displaced with respect to each other in conformance with the lateral displacement of the interior side surfaces of the fry pot, the tubular side sections being substantially coextensive with the lateral peripheral dimensions of the corresponding fry pot interior side surfaces for permitting nesting engagement of the shower apparatus with the fry pot, the tubular side sections having a plurality of outlet ports for discharging jets of the filtered cooking oil into and along interior side surfaces of the fry pot for dislodging food particles which cling to the sides of the fry pot, the outlet ports being aimed for discharging jets of cooking oil substantially vertically downwardly along the corresponding interior side surfaces of the fry pot wherein the heating means is an electrical resistance heating element for generating heat in response to the flow of electrical current through the resistance portion of the heating element, the heating element having first and second electrical terminal portions, the filter system further including:

a first electrical bus for conducting electrical current;

an on-off switch connected to permit manual control of the application of electrical current from an external power source to the first electrical bus;

a second electrical bus for returning electrical current conducted through the first electrical bus to the external power source;

a power contactor having a pair of normally closed contacts, a pair of normally open contacts, and a solenoid assembly operably connected to open the normally closed contacts and to close the normally open contacts in response to the flow of current through the solenoid;

the normally closed contacts of the power contactor being connected in series electrical relation between the first electrical bus and the first electrical terminal of the resistance heating element;

the second electrical terminal of the resistance heating element being connected to conduct current to the second electrical bus;

a safety switch having a pair of electrical contacts and an actuator operably coupled thereto for opening and closing the contacts, the actuator being responsive to the operating mode of the drain valve to cause the electrical contacts to close when the drain valve is opened and to cause the electrical contacts to open when the drain valve is closed;

the electrical contacts of the safety switch being connected in series electrical relation between the first electrical bus and the solenoid;

the solenoid being connected in series electrical relation between the safety switch and the second electrical bus; and,

the normally open contacts of the power contactor being electrically connected in parallel circuit relation with the electrical contacts of the safety switch.

4,324,174

APPARATUS FOR THE PREPARATION OF SHISH KABOBS

James C. Conradt, 1450 Lawrence Ave., Hamilton, Ohio 45013

Filed Dec. 3, 1980, Ser. No. 212,358

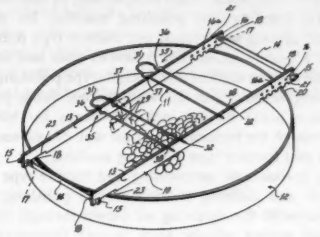
Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 H **6 Claims**

1. Apparatus for preparing shish kabobs comprising:

a rectangular frame adapted to rest on a grill and having two opposed spaced skewer supports,

a plurality of "U"-shaped skewers presenting two prongs connected by a bight portion resting upon said two skewer supports,



abutment means adjacent the bight portion of said "U"-shaped skewers limiting the extent to which food is slid down said prongs to said bight portion.

4,324,175

APPARATUS FOR RICE POLISHING

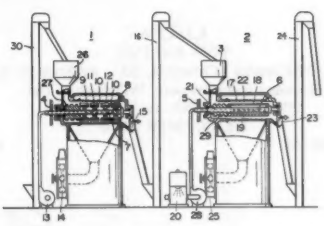
Toshihiko Satake, Higashi Hiroshima, Japan, assignor to Satake Engineering Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 872,077, Jan. 25, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 92,018

Claims priority, application Japan, Apr. 1, 1977, 52/37933

Int. Cl.³ B02B *3/04, 3/12*

U.S. Cl. 99—519 **7 Claims**



1. A rice grain polishing apparatus comprising the combination of:

(A) a grinding-type grain polishing machine including:

(a) inlet means for unpolished rice grains;

(b) feed screw means for advancing the unpolished rice grains,

(c) a plurality of axially spaced apart, grinding-type polishing rolls of the type capable of providing a large number of scars on the surface of the rice grains to thereby partially polish them and to permit the rapid addition of moisture on the surface thereof;

(d) a first tubular, rotatable shaft having a perforated wall commonly supporting and driving said polishing rolls at a first speed, there being further included means for blowing air through the holes in the wall of said first shaft;

(e) a porous wall surrounding said grinding polishing rolls and defining a grinding-type polishing chamber therewith for receiving the air blown through the walls of said first shaft; and

(f) outlet means for the partially polished rice grains; and

(B) a humidifying friction-type rice grain polishing machine including;

(a) inlet means for receiving the partially polished rice from said outlet means in said grinding-type polishing means;

(b) feed screw means for advancing the partially polished rice grains;

(c) at least one hollow friction-type polishing roll having at least one opening through the wall thereof;

(d) a second tubular shaft independent of said first shaft in said grinding-type polishing machine for supporting and driving said at least one friction type polishing roll at a second speed that is slower than said first speed, said second shaft of said friction-type polishing machine being hollow and the wall thereof being perforated, there being further included means for blowing air through the perforations in the wall of said second shaft in said friction-type polishing machine;

(e) a porous wall surrounding said friction-type polishing roll and defining a friction-type polishing chamber therewith for receiving air blown through the wall of said second tubular shaft in said friction-type grain polishing machine;

(f) means for delivering humid air only into said friction-type polishing chamber whereby the scratched, partially polished rice grains in said friction-type chamber in said friction-type grain polishing machine are impregnated with the humid air and the humid air impregnated rice grains are completely polished to a superluster; and

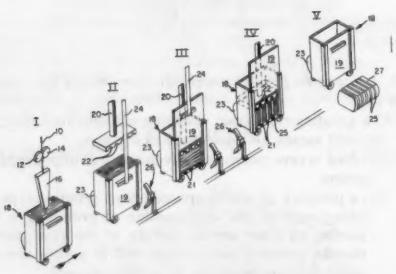
(g) outlet means for the completely polished rice grains.

4,324,176

TOW BALING

Robert M. McCormick, Columbia, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 7, 1980, Ser. No. 119,376
Int. Cl.³ B65B *13/06*
U.S. Cl. 100—3 **1 Claim**



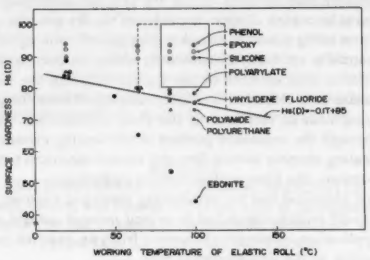
1. A process for preparing a nude-strapped bale of tow comprising: depositing said tow in a portable flat-sided container having an opening at its top to accept the tow, said container having a sliding door in one side to expose the deposited tow, there being aligned strapping guides on the bottom and the side opposite the sliding door of the container; moving said container underneath a ram, said ram having strapping guides in its bottom surface; lowering said ram through the opening in said container to compress and stabilize said tow in one stroke; compressing said tow with said ram by moving said ram downward to a location where the strapping guides on the ram's surface align with the strapping guides on the side of the container; lifting said sliding door to expose said tow; strapping said compressed tow; raising said ram out from said container; ejecting the strapped bale of tow and moving said container to another location out from under the ram.

4,324,177

CALENDER ROLL FOR SUPERCALENDER

Nobuo Tsuji; Masaaki Fujiyama; Hiromi Nakahara; Eiichi Tadokoro; Keiji Tanaka, and Isao Yamamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 7, 1980, Ser. No. 138,076
Claims priority, application Japan, Apr. 9, 1979, 54-42855
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—155 R **8 Claims**



1. In a supercalendar comprising a metal roll and an elastic roll for smoothing the surface of a web by nipping the web between the metal roll and the elastic roll, the improvement which comprises, said elastic roll formed from a material satisfying the conditions of

$$Hs(D) \geqq -0.1\ T + 85$$

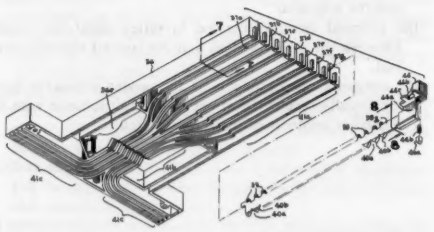
at a linear pressure between the rolls of 50 to 500 Kg/cm, where Hs(D) is Shore hardness D-scale of the surface of the elastic roll, and T is the working temperature (°C.) of the elastic roll varying within the range of $60 \leqq T \leqq 120$.

4,324,178

IMPRINTING MACHINE WITH WHEEL SETTING RACK MECHANISM

William P. Barbour, Mount Prospect, Ill., assignor to Security Imprinter Corporation, Walkersville, Md.

Filed May 2, 1980, Ser. No. 146,099
Int. Cl.³ B41F *1/08*
U.S. Cl. 101—45 **32 Claims**



1. A variable data imprinting machine comprising an elongated housing defining a substantially rectangular elongated flat printing bed providing a document supporting surface and having first and second sides, a print wheel pack formed of rotatable, coaxial side-by-side closely adjacent print wheels each having circumferentially spaced raised-number-bearing imprint block formations separated by notches about their peripheries for imparting impressions to a document on the document supporting surface, an imprinting carriage movable through advance and return strokes longitudinally along the

document support surface having a roller platen for transfer of imprinted characters to the document during one of said strokes, an elongated rack case perpendicularly transvering said housing subjacent the wheel pack having a number-bearing rack control panel portion projecting beyond the first housing side, a plurality of elongated flexible slide straps of transversely thin vertically elongated cross-section having opposite ends located near opposite longitudinal ends of the rack case and forming toothed racks slidable longitudinally in said rack case, said racks having teeth along their upper edges engaging the peripheral notches of the respective print wheels to rotatably index the print wheels to selected number-printing positions, the rack case having means forming plural elongated guide slot trackways therein having paired confronting sides spaced to correspond to the width of the straps to receive and guide the toothed racks therein for their longitudinal wheel-indexing movement, said guide slot trackways defining serpentine paths in top plan providing intermediate laterally closely adjacent path segments underlying and vertically aligned with the respective print wheels directed longitudinally of the case and communicating transition segments curving in lateral diverging relation therefrom to join more widely spaced parallel trackway path segments also directed longitudinally of the case and underlying the control panel portion.

4,324,179

METHOD OF PROOF-PRINTING IN GRAVURE PRINTING

Katsusuke Nagano, Mitaka, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,732
Claims priority, application Japan, Sep. 24, 1976, 51/114516
Int. Cl.³ B41N *1/06*
U.S. Cl: 101—170 **2 Claims**

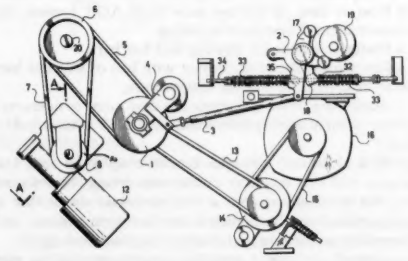
1. A gravure proof-printing method which comprises superposing a contact screen upon the photosensitive layer of a plate blank for offset printing, superposing further thereon a continuous-tone positive for gravure printing, exposing the plate to light from the side of the positive for photoprinting, developing the resulting plate to produce a printing plate, and using this plate to make a proof for gravure proofing and correction.

4,324,180

DRIVE DEVICE

Jaroslav Jiruse, Blansko, and Antonin Svobodova, Adamov, both of Czechoslovakia, assignors to Adamovske Strojirny, Narodni Podnik, Adamov, Czechoslovakia

Filed Sep. 17, 1980, Ser. No. 188,061
Claims priority, application Czechoslovakia, Sep. 22, 1979, 6397-79
Int. Cl.³ B41F *5/00*
U.S. Cl. 101—216 **4 Claims**



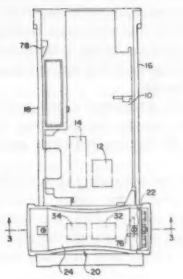
1. A drive device for an offset printing machine which comprises a drive motor, operatively connected to a variable speed belt drive mounted on a swinging support, which is pivotally connected to a first end of an adjustable draw bar, the second end of the draw bar is pivotally connected to a control lever pivotally mounted on the printing machine, the variable speed belt drive is connected by means of a first drive belt to a common pulley which is operatively connected to the printing machine, a second belt which engages with the common pulley is linked to a pulley mounted on a freely rotating shaft of an electromagnetic clutch means whereby when the power to the drive motor is stopped, the electromagnetic clutch means can be activated to affect the rotation of the machine through a drive part.

4,324,181

IMPRINTER WITH PLURAL SELECTIVELY OPERATING PLATEN ROLLERS

John A. Maul, Sr., Lyndhurst, Ohio, assignor to DBS, Inc., Randolph, Mass.

Filed Dec. 26, 1979, Ser. No. 106,851
Int. Cl.³ B41F *3/04*
U.S. Cl. 101—269 **8 Claims**



1. An imprinter comprising:

a bed;

a platen carriage guidingly associated with the bed for motion along the same;

first and second roller platens mounted on said carriage for rotary motion, each about its axis;

translating means responsive to carriage position for lowering and raising of said platens toward and away from the bed as the carriage is moved along the bed; said translating means including a transition means manually movable from a first position to a second position with respect to said platen carriage for converting the operation of the imprinter from (a) a first mode wherein the first and second roller platens are both lowered towards the bed during movement of the carriage in a first direction along the bed and both raised away from the bed during movement of the carriage in a direction opposite the first direction to (b) a second mode wherein the first roller platen is lowered toward the bed and the second roller platen is raised away from the bed during carriage movement in said first direction and the first roller platen is raised away from the bed and the second roller platen is lowered toward the bed during carriage movement in said opposite direction.

4,324,182
APPARATUS AND METHOD FOR SELECTIVELY ACTIVATING PLURAL ELECTRICAL LOADS AT PREDETERMINED RELATIVE TIMES

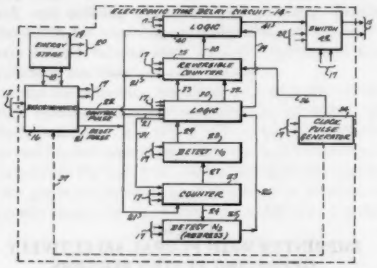
Ian J. Kirby, Warrington; Michael I. Mitchell, Chester, and Andrew Stratton, Farnborough, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 22, 1979, Ser. No. 5,551

Claims priority, application United Kingdom, Feb. 2, 1978, 4057/78

Int. Cl.³ F42C *11/00*

U.S. Cl. 102—217 **64 Claims**



1. Apparatus for selectively activating a plurality of electrical loads at respectively corresponding predetermined relative times, said apparatus comprising:

a central unit for providing reference timing signals, and

a separate electrical timing and load activation device electrically connected with each electrical load and also connected to receive said reference timing signals,

each of said devices including timing means,

means for providing first and second signals from the reference timing signals,

a source of locally generated clock pulses,

a timing counter means for counting the number of said clock pulses occurring between said first and second signals, and

activation means for activating the connected electrical load after a subsequent time delay measured by counting a number of said clock pulses, the number of clock pulses counted bearing a predetermined relationship to the number counted between said first and second signal.

4,324,183
SMOKE PROJECTILE CHARGE

Georg Prahauser, Oberalm, Austria; Robert Schmidlin, Neuenburg, and Wolfgang Trede, Weil-Otlingen, both of Fed. Rep. of Germany, assignors to Buck Chemisch-Technische Werke GmbH & Co., Bad Uberkingen, Fed. Rep. of Germany

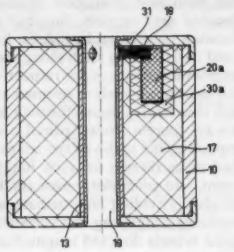
Filed Sep. 21, 1979, Ser. No. 77,744

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841815

Int. Cl.³ F42B *13/44*; F42C *19/02*

U.S. Cl. 102—334 **5 Claims**

5. A projectile charge of smoke cups adapted to be stacked one above the other in a small jacket in discharging direction, the smoke cups comprising a closed metal case with a smoke charge comprising hexachloroethane, zinc oxide and metal powder fully filling the case, the smoke cups being adapted to rest one upon another with total surface contact, and the component parts of each cup case consisting of the same material, whereby the supporting components have identical strength, the metal cases consisting of two coaxial tubes which form between themselves an annular chamber for the smoke composition charge, which chamber is covered on both sides by annular lids, and wherein the smoke composition charge is highly compressed with a pressure of at least 1300 kp/cm² [91 PSI] and is thus self-supporting in itself, said charge having a fuse system comprising at least one priming cartridge, this cartridge being embedded in a transmission composition and compressed with the transmission composition at the smoke composition charge pressure to form a block which is inserted in a recess in the compressed smoke composition charge, said



transmission composition comprising the same components as the smoke composition and said priming cartridge being in communication with the interior of the inner tube of the case via a capillary delay tube whereby reliable, uninterrupted smoke production is achieved.

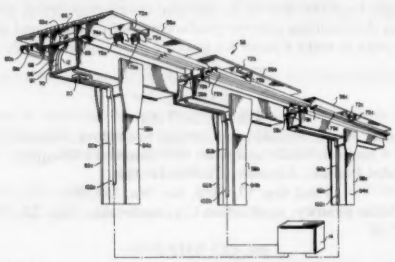
4,324,184
TEMPERATURE CONTROL SYSTEM AND METHOD FOR AN AUTOMATED GUIDEWAY TRANSIT SYSTEM

Donald P. Sullivan, Burnsville, Minn., assignor to Universal Mobility, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 133,194, Mar. 24, 1980, abandoned. This application May 13, 1980, Ser. No. 149,602

Int. Cl.³ G08B *21/00*

U.S. Cl. 104—279 **28 Claims**



15. A temperature control system for preventing the formation of frost or dew on the bus bars of an AGT system, the temperature control system comprising:

(a) a heating element for heating said bus bars;

(b) a first sensor placed in contact with one of said bus bars so as to detect the bus bar temperature;

(c) a second sensor for detecting the dew point temperature of the ambient atmosphere about said AGT system guideway;

(d) a first electronic amplifier circuit coupled to said first sensor, said first amplifier circuit converting the detected bus bar temperature into a first electrical signal that is proportional to the detected bus bar temperature, and thereafter amplifying and transmitting said first signal;

(e) a second electronic amplifier circuit coupled to said second sensor, said second amplifier circuit converting the detected dew point temperature into a second electrical signal proportional to said detected dew point temperature, and thereafter amplifying and transmitting said second signal;

(f) a first electronic comparator circuit coupled to the out-

puts of said first and second amplifier circuits, said first comparator circuit detecting the magnitude of the difference between the transmitted first and second signals and triggering a first output signal whenever said difference reaches a set level;

(g) a second electronic comparator circuit coupled to said first amplifier circuit, said second comparator circuit comparing said first electrical signal to an internal reference signal and triggering a second output signal whenever said first signal is less than or equal to said internal reference signal;

(h) means, coupled to the outputs of said first and second comparator circuits, for developing a triggering signal in response to said first and second output signals from said comparator circuits; and

(i) an electronic relay device controlled by said means (h) and coupled to said heating element, whereby said heating element will be energized when the relay is triggered by the triggering signal from said means (h).

4,324,185

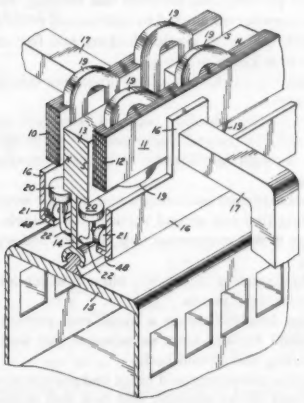
PERMANENT-MAGNET-LEVITATED TRANSPORTATION SYSTEM

Roy D. Vinson, 146 Cottage Dr., Covina, Calif. 91722

Filed Jul. 21, 1980, Ser. No. 170,615

Int. Cl.³ B61B *13/08*

U.S. Cl. 104—283 **7 Claims**



1. A permanent magnet levitation system for use in transportation comprising:

a pair of horizontally spaced rail members composed of ferromagnetic material;

at least two permanent levitation magnets positioned between said rail members in transverse alternating polarity alignment with air gaps between said magnets and both rail members, said levitation magnets and said rail members providing generally horizontal magnetic flux paths through said air gaps;

at least one cargo compartment supported by said magnets; and

means for maintaining said permanent magnets horizontally central between said rail members.

4,324,186

CONVERTIBLE RAIL-HIGHWAY LATERAL TRACK SET OFF APPARATUS

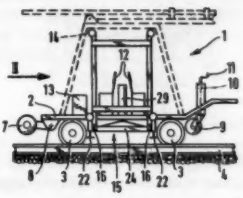
Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 15, 1979, Ser. No. 84,649

Claims priority, application Austria, Dec. 11, 1978, 8811/78

Int. Cl.³ B61B *12/00*; B61D *15/00*; B61F *13/00*

U.S. Cl. 105—177 **4 Claims**



1. A railway carriage having two undercarriages for running on a track and comprising a set-off apparatus for moving the carriage transversely off the track, the set-off apparatus including

(a) a carrier body having auxiliary running gears,

(b) a power drive means vertically movably mounting the carrier body on the carriage,

(c) an auxili rack extending transversely to the track, the auxiliary t k having

(1) two rails supporting the auxiliary running gears, each of the auxiliary track rails consisting of at least two rail sections pivotally connected to each other at adjoining ends, one of the rail sections of each auxiliary track rail being pivotal from an operating position flush with the other rail section into a vertical position,

(2) struts interconnecting the two rails,

(3) a hydraulic drive interconnecting the adjoining rail section ends for pivoting the one rail section, and

(4) a support mounted on ends of each of the rails, and

(5) a power actuated means vertically adjusting the support, and

(d) a drive having respective parts interconnecting the carriage and the auxiliary track rails for transversely moving the carriage.

4,324,187

RAIL VEHICLE HAVING A ROLL SUPPORT DEVICE

Claudio Sambo, Winterthur, Switzerland, assignor to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Aug. 29, 1979, Ser. No. 70,742

Claims priority, application Switzerland, Sep. 4, 1978, 9282/78

Int. Cl.³ B61F *5/24*

U.S. Cl. 105—199 A **13 Claims**

1. A rail vehicle comprising

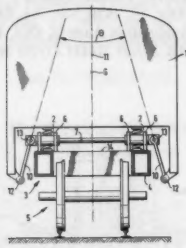
a vehicle body having a center of gravity;

at least one truck for supporting said body on rails, said truck including a truck frame and at least one set of wheels for rolling on rails;

a resilient support means supporting said body on said truck frame with said body being essentially freely movable in a transverse direction relative to said truck frame; and

a roll support means including two connecting elements coupling said vehicle body and said truck frame together without transmitting the weight of said body to said frame, said elements being disposed on opposite sides of a vertical center plane extending longitudinally of said body and on axes disposed in angular relation to said plane to define an included angle of at least 10°, said axes intersect-

ing at a point located above said center of gravity of said body whereby under the action of a centrifugal force on said vehicle body, said connecting elements are subjected



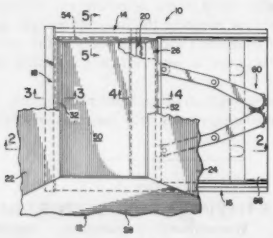
to a relative tilting motion which causes an inclination of said body about said center of gravity opposed to said centrifugal force.

4,324,188

HOPPER DISCHARGE OUTLET AND METHOD

William E. Fritz, Naperville, Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Mar. 3, 1980, Ser. No. 126,397
Int. Cl.[3] B61D *7/06, 7/20, 7/24*
U.S. Cl. 105—282 R **5 Claims**



1. In a discharge outlet assembly for a hopper having downwardly and inwardly inclined side walls and end walls defining a hopper discharge opening, a discharge chute extending below said hopper discharge opening and a gate for opening and closing said hopper discharge opening supported for reciprocable movement by said discharge chute, the improvement comprising:

a pair of integral cold formed members defining side walls of said discharge chute

said cold formed members each having an upper inwardly and downwardly directed flange;

said flanges' top surfaces each engaging an outside surface of one of said downwardly and inwardly inclined side walls of said hopper;

said flanges' bottom surfaces each defining an elongated groove with a remaining portion of its respective integral cold formed member;

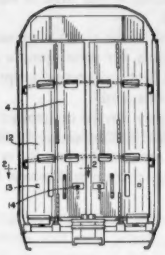
said grooves each having a downwardly and inwardly directed surface for movingly and sealingly supporting said gate.

4,324,189

CAR END FOLDABLE DOORS LOCKING DEVICE

David J. Roldness, San Diego, Calif., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 17, 1980, Ser. No. 130,881
Int. Cl.[3] B60P *3/08;* **B61D** *17/00;* **E05C** *19/12;* **E05D** *15/26*
U.S. Cl. 105—378 **12 Claims**



1. A door for use in railway cars comprising first and second panels foldably interconnected and being automatically coupleable together by a locking device, said locking device including a housing of hot shape, and having an intermediate flange and two oppositely extending flanges fastening said housing to said first door panel,

a lever projecting inwardly through said housing and having inner an outer portions,

biasing means comprising spring means inside said housing and urging said lever inner portion to locking position,

means for pivoting said lever on said housing, and

a keeper member connected to said second panel and coacting with said lever portion locking said first and second panels in a folded position.

7. In a railway car having a body including side walls and a roof structure,

said body having a loading end, and lower and upper cargo supporting horizontal decks adapted to be loaded with cargo through said loading end, the improvement comprising;

a door arrangement including a pair of door structure ends including first and second vertical door panels,

first hinge means interconnecting said first and second door panels,

second hinge means including a hinge bracket connected to said outer door panels,

said hinge bracket having a hinge end portion spaced a substantial distance from an adjacent side wall and from the loading end of said body,

pivot means connecting said hinge end portion to said upper and lower decks whereby said first and second vertical door panels may be folded together and hingedly moved to a position parallel to an adjacent side wall,

said locking device including a housing of hat shape, and having an intermediate flange and two oppositely extending flanges fastening said housing to said first door panel,

a lever movablely mounted on and projecting inwardly through said housing including a handle portion and a keeper engaging portion,

said first panel having an opening and said keeper engaging portion projection through said opening,

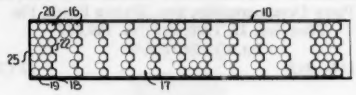
biasing means comprising spring means urging said keeper engaging portion to a locking position, and

a keeper member connected to second panel coacting with said keeper engaging portion locking said first and second panels in a folded position.

4,324,190
PALLET AND METHOD OF LOADING VEHICLES UTILIZING SAME

Norman S. Hewitt, Chicago, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 8, 1980, Ser. No. 138,398
Int. Cl.³ B65D *19/24*
U.S. Cl. 108—51.1 9 Claims

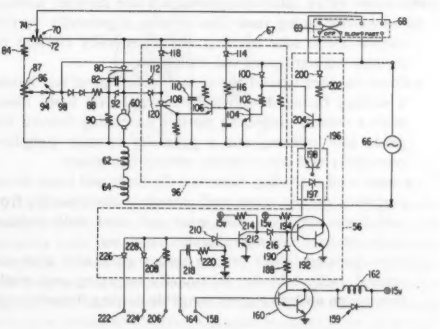


1. A pallet particularly adapted for holding plural cylinderical items arranged in adjacent parallel rows with items of adjacent rows being offset in the direction of said row and internested, said pallet having remote sides and ends, said sides extending longitudinally and and continuous in the intended row direction and being parallel, and said ends extending generally transversely of said row direction, at least one of said ends including plural first edge portions disposed in transversely alternating longitudinally offset parallel relation with there being one first edge portion for each intended row, and diagonal second edge portions positioned to bridge adjacent intended rows and joining adjacent ones of said first edge portions.

4,324,191
AUXILIARY SEWING MACHINE MOTOR BRAKING

Jack Brown, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 8, 1981, Ser. No. 271,446
Int. Cl.³ D05B *69/22, 3/02*
U.S. Cl. 112—277 3 Claims

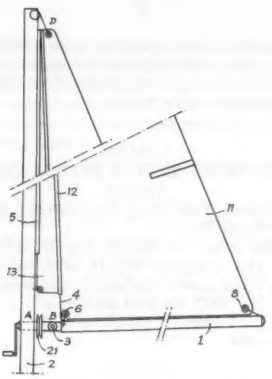


1. An auxiliary sewing machine motor braking arrangement for an electronically controlled sewing machine having a frame supporting an endwise reciprocatory and laterally oscillatable needle carrying needle bar, means for selectively suspending endwise reciprocatory motion of said needle bar, a feed system for feeding a work material through said sewing machine at a selected rate in a selected direction, means for selectively nulling feeding of said work material through said sewing machine, means for urging said needle bar to selective lateral positions, means for constraining said feed system to feed work material at a selected rate in a selected direction, means for selectively actuating said needle bar into endwise reciprocatory motion and said feed system into feeding motion, means for electrically braking said actuating means when actuation thereof is not selected, a solid state memory means for retaining digital code words representative of needle stitch position and of feed increment from a previous stitch position of a sequence of stitches for at least one pattern having an identifiable beginning and last stitch, means for selecting implementation of a single pattern terminating in said last stitch, an arm shaft actuated by said actuating means and making one revolution for each endwise reciprocatory movement of said needle bar, an arm shaft position sensing means for timing the release of needle position and feed increment information from said memory to said urging and said constraining means for implementing said stitches to form said pattern, means responsive to selection of said single pattern selecting means and to said last stitch of said at least one pattern for enabling said suspending means and said nulling means, means for detecting the completion of a single pattern, and means responsive to said detecting means for compelling said braking means to brake said actuating means.

4,324,192
DEVICES FOR SETTING A SAIL

Pierre Ingouf, 131, rue de la Sante, Paris, France (75013)

Filed Nov. 5, 1979, Ser. No. 91,133
Claims priority, application France, Nov. 7, 1978, 78 32049
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—106 5 Claims



1. A device for setting, maintaining and rolling up a sail of the type comprising a mast, a boom connected to the mast by a universal joint and associated with a device for driving it in rotation and at least one bolt rope tunnel extending generally along and spaced from the mast to receive a bolt rope borne by the corresponding edge of the sail wherein said bolt rope tunnel extends from the head of the mast toward a point of the boom which is located outside the universal joint with respect to the mast, said bolt rope tunnel being borne by a connecting member mounted on said mast for rotation about a vertical axis and extending over the area between the mast and said bolt rope tunnel.

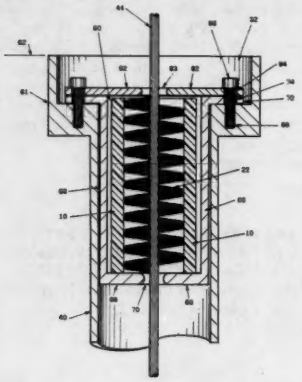
4,324,193
METHOD FOR SNUBBING OR RESTRAINING A CABLE

Christopher R. Cutler, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jun. 20, 1979, Ser. No. 50,406
Int. Cl.³ B63B *21/08*
U.S. Cl. 114—199 8 Claims

1. In towing a floating vessel by a ship wherein a cable, which is not used to tow the vessel, is in communication with the ship and the floating vessel such that an exposed portion of the cable extends from the ship to the vessel and a second portion of the cable passes through the structure of the vessel, the improved method for maintaining slack in the exposed portion of the cable comprising the steps of

attaching a plurality of flexible elements to a sleeve with the exposed ends of the flexible elements extending from the wall of the sleeve inwardly into an annulus formed by the inner surface of the sleeve in contact with the surface of the second portion of the cable,



placing the sleeve in an embracing relation about the second portion of the cable such that the second portion of the cable extends through the annulus of the sleeve, and affixing the sleeve to the vessel.

4,324,194

STABILIZED HOIST RIG FOR DEEP OCEAN MINING VESSEL

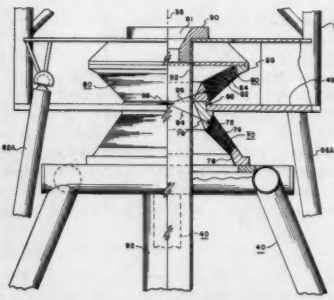
Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra-Rig, Inc., Fort Worth, Tex.

Continuation of Ser. No. 748,839, Dec. 10, 1976, Pat. No. 4,200,054. This application May 21, 1979, Ser. No. 40,972

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ B63B *35/44*

U.S. Cl. 114—264 **4 Claims**



3. In a vessel of the type including a hoist rig for supporting a string of pipe in pendulous suspension, a bearing member disposed intermediate the hoist rig and the vessel for supporting the hoist rig and a pipe string suspended therefrom, the bearing member comprising a first annular section of a substantially spherical laminated body of superposed layers of an elastic material and a relatively inelastic material to permit angular displacement of the hoist rig with respect to the vessel and a second annular section of a substantially spherical laminated body of superposed layers of an elastic material and a relatively inelastic material spaced axially from said first annular section with respect to the longitudinal axis of said string of pipe to permit angular displacement of the hoist rig with respect to the pipe string.

4,324,195

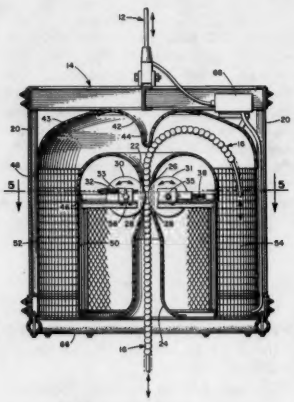
TENDER FOR SUBMARINE CABLE

Frank D. Cunningham, Tequesta; Michael A. Witt, Palm Beach Gardens, both of Fla., and Robert M. Hill, Katy, Tex., assignors to Perry Oceanographics, Inc., Riviera Beach, Fla.

Filed Sep. 22, 1980, Ser. No. 189,657

Int. Cl.³ B63F *8/00*

U.S. Cl. 114—312 **12 Claims**



1. A tether tender for paying out and taking in an elongated underwater tether cable comprising a frame member having:

an upwardly facing inner funnel with a generally vertical central guide tube opening and a generally circular periphery outwardly curved therefrom;

a dome member spaced above said inner funnel and having a surface facing downwardly toward said inner funnel with a central projecting portion extending toward said guide tube opening and a generally circular periphery outwardly and downwardly curved therefrom;

an inner wall extending downwardly from said inner funnel periphery and an outer wall extending downwardly from said dome periphery, said inner and outer walls defining an annular storage area therebetween; and

power operated tether driving means associated with said central guide tube for frictionally engaging and axially moving an underwater tether cable passing therethrough.

4,324,196

THERMOSTAT ATTACHMENT FOR A RADIATOR VALVE

Aage Molgaard, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 14, 1980, Ser. No. 178,101

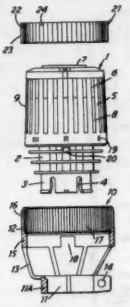
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 2932884

Int. Cl.³ F16K *27/08*

U.S. Cl. 116—277 **9 Claims**

1. A thermostat unit adapted to be attached to a radiator valve having a rotatable adjusting spindle and a surrounding ring shaped housing portion, comprising, a rotary knob unit having a generally cylindrically shaped body portion and a

smaller diameter neck portion for engaging a valve adjusting spindle, and a base unit having a supporting ring portion and a



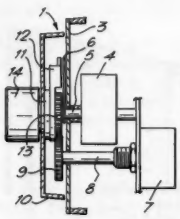
tightening ring portion which surrounds said knob unit neck portion and is attachable to a valve housing.

4,324,197

INSTRUMENT ASSEMBLY

Ronald H. Parfitt, 88 Broadway, Letchworth, Hertfordshire, England

Filed Aug. 11, 1980, Ser. No. 176,730
Int. Cl.³ G01D *13/22*
U.S. Cl. 116—300 **7 Claims**



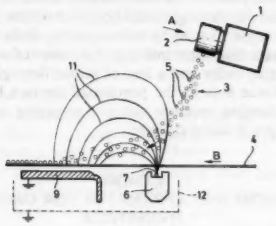
1. A control instrument comprising a housing, a single scale fixedly mounted on a face of said housing, two value indicator elements both positioned in front of said scale and rotatable independently of each other over the scale and about a common axis, one of the indicator elements being an actual value indicator element and the other of the indicator elements being a set-point indicator element, the scale having a series of graduations extending around at least 180° of a circle centered on said common axis, meter means mounted within said housing and operatively connected to the actual value indicator element for moving it to rotational positions around said axis in response to corresponding inputs to said meter means, control signal output means also mounted within said housing, a manually operable rotatable control knob centered on said axis and directly connected to said set-point indicator element for moving it to rotational positions around said axis so that the number of degrees of rotation of said set-point indicator element in response to a given amount of rotation of said control knob is the same regardless of the angular position of said set-point indicator element, and means mechanically connecting said set-point indicator element to said control signal output means to obtain a control signal output corresponding to a given position of said set-point indicator element.

4,324,198

DEVICE FOR THE ELECTROSTATIC APPLICATION OF MATERIAL PARTICLES ENTRAINED IN A STREAM OF GAS TO AN ADVANCING, FLAT SUBSTRATE

Edwin Muz, Reutlingen, Fed. Rep. of Germany, assignor to Weitman and Konrad GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,804
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936754
Int. Cl.³ B05B *5/02*
U.S. Cl. 118—630 **3 Claims**



1. Device for the electrostatic application of particles emerging from a source and being entrained in a stream of gas to an advancing, flat substrate in the form of webs or sheets of electrically non-conductive material, the particles being deposited from the source above said advancing substrate, characterized by the following features:

(a) The stream of gas (3) carries electrically neutral material particles (5) with it;

(b) beneath the advancing substrate (4) in the area of the position of impingement of the gas stream on the substrate is located at least one charging electrode (6) for the production of a corona discharge;

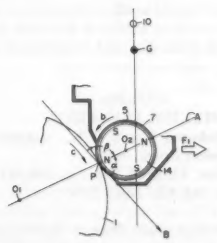
(c) at least one counterelectrode (9) is located below said substrate in the direction of advance (B) of the substrate at a distance from the charging electrode (6).

4,324,199

DEVELOPING DEVICE

Teruo Morikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1980, Ser. No. 121,658
Claims priority, application Japan, Feb. 20, 1979, 54/19303
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—658 **17 Claims**



1. A developing device for imparting toner to a latent image on a rotating image bearing member to form a visible image, comprising:

a rotatable developer holding cylinder for holding developer on a portion of the cylindrical surface thereof;

means for maintaining said surface portion in a predeter-

mined spaced relation with said image bearing member, said maintaining means including pressure applying means for resiliently urging said developer holding cylinder toward said image bearing member for maintaining said predetermined space constant;

engaging means on said cylinder for contacting said rotating image bearing member to provide a drive force for transmitting the rotational movement of said image bearing member to said developer holding cylinder;

a developing device box for supporting said developer holding cylinder; and

holding means for freely suspending and holding said developing device box;

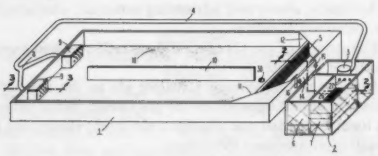
wherein the position for said holding means to suspend and hold said developing device box is set within the area of an obtuse angle formed by a line passing from the center of said image bearing member to the center of said developer holding cylinder and a line of action through which said drive force acts at the portion of contact between said image bearing member and said engaging means of said developer holding cylinder.

4,324,200

METHOD AND APPARATUS FOR GROWING HYDROZOA

E. Marshall Johnson, Philadelphia, Pa., assignor to Rockhill Enterprises, Philadelphia, Pa.

Filed Feb. 8, 1980, Ser. No. 119,658
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **32 Claims**



1. Method for growing hydrozoa which produce offspring having a specific gravity substantially equal to unity, comprising the steps of:

providing a liquid medium consisting chiefly of water in which said hydrozoa can live and reproduce by budding;

providing a wide, shallow, substantially elongated flat-bottomed tank having a roughened bottom surface for containing said medium;

establishing an initial population of hydrozoa in said medium;

periodically feeding said hydrozoa;

permitting said offspring to float to the surface of said medium; and

providing a current in said medium from a source at one end of said tank to overflow means at the other for collecting said offspring on a net disposed in said current.

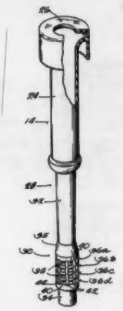
4,324,201

MILKING INFLATION

Leigh R. Larson, Johnson Creek, Wis., assignor to Hi-Life Rubber, Inc., Johnson Creek, Wis.

Filed Nov. 13, 1980, Ser. No. 206,384
Int. Cl.³ A01J *5/04*
U.S. Cl. 119—14.51 **8 Claims**

1. A milking inflation made from a flexible material and having a tubular body including a shell end portion adapted to be slipped onto a nipple on the claw of the milking machine, said claw end portion having a substantially constant inside diameter and a thickened wall section in the region near the outer end of the claw nipple, said thickened wall section having an outer surface and including a plurality of axially-spaced, circumferentially-extending rows of external recesses extending inwardly from said outer surface, each of said rows including a plurality of said recesses which are circumferentially spaced and are separated by a segment of said thickened wall section, said recesses imparting flexibility to said thickened



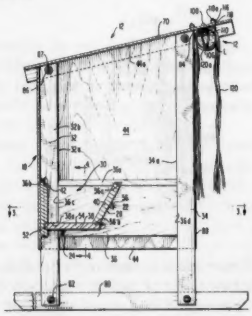
wall section so that the inner wall thereof can sealingly engage the outer end of the claw nipple to shut off communication between the claw and the inflation.

4,324,202

KNOCK DOWN WEATHER AND SALT RESISTANT SALT AND MINERAL FEEDER FOR CATTLE

Jimmy B. Stonestreet, Rte. 2A, Box 127, Boyce, Va. 22620, and John M. Rohrbaugh, 15125 Braddock Rd., Centerville, Va. 22020

Filed Mar. 4, 1981, Ser. No. 240,352
Int. Cl.³ A01K *5/01*
U.S. Cl. 119—51 R **8 Claims**



1. A knock down salt and mineral feeder for cattle and the like, said feeder comprising:

two oppositely facing sidewall subassemblies,

a rear wall subassembly,

each sidewall subassembly comprising:

front and rear vertical posts,

an elongated trough sideboard spanning between said posts and mortise and tenon connected thereto at respective ends thereof,

said rear posts bearing a vertical mortise slot on an inside face thereof,

a horizontal mortise slot within the inner face of said trough sideboard and extending forwardly from a rear edge thereof and including a horizontal mortise slot extension portion within said rear post intersecting with said vertical mortise slot,

an inclined mortise slot within said trough sideboard and extending from said horizontal mortise slot at the forward

end thereof to the top of said trough sideboard and being inclined upwardly and outwardly towards said front post,

a side panel fixed to the outside of said front and rear posts and said trough sideboard and extending from the top of said posts to the bottom of said trough sideboard,

said rear wall subassembly comprising:

a rear panel corresponding in height to that of said sidewall subassembly side panels,

a trough rearboard fixed to the inside of said rear panel, being coplanar therewith and extending across a portion of said rear panel and terminating in tenons at each end thereof and fitted to said rear post vertical mortise slots,

said rear panel being of a length and positioned such that the ends of said rear panel overlap the ends of said respective side panels,

said trough rearboard including a horizontal mortise slot within the inner face thereof near the bottom of said trough rearboard,

a trough bottom board having a longitudinal edge fitted within said horizontal mortise within said rear board and ends fitted within said horizontal mortise slots within said side boards, and

rods extending through said sidewall assemblies at said trough sideboards, and

nuts threaded to the ends of said rods outside of said side wall subassemblies side panels to lock said sidewall subassemblies to said rear wall subassembly with said trough bottom and front boards within respective mortise slots to form, with said trough sideboards and rearboard, an upwardly open salt and mineral trough at the rear of said feeder and remote from an open front thereof integrated with said sidewall and rear wall assemblies,

said feeder further comprising a roof subassembly, said roof subassembly comprising:

a rectangular roof panel having a lateral width in excess of the width of said rear wall subassembly rear panel,

a pair of sideboards extending along the lateral side edges of said roof panel and being fixed to the bottom of said roof panel, and

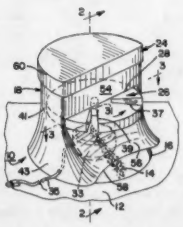
means for bolting said sideboards to the upper ends of said posts, with said roof panel overhanging the open front of said feeder, thereby permitting quick and easy on site assembly of said feeder, while permitting shipment of said feeder as stacked components in compact fashion, prior to onsite assembly.

4,324,203

ANIMAL FEEDING APPARATUS

Arthur B. Chiappetti, Chicago, Ill., assignor to Bernard L. Kleinke, Palatine, Ill., a part interest

Filed Feb. 4, 1980, Ser. No. 118,163
Int. Cl.[3] **A01K** *5/02;* **G01F** *11/00*
U.S. Cl. 119—51.11 **3 Claims**



1. In an animal feeding apparatus having means defining a storage compartment in a housing for confining animal food items and having a mechanism for dispensing the food items from the storage compartment for feeding purposes, an arrangement comprising:

said means defining a compartment having a wall transverse to the vertical axis thereof, the housing having a front face, said front face having means defining an opening disposed above the wall communicating with the interior of the storage compartment, the mechanism having a rotatably mounted member being disposed partially within the storage compartment and extending outwardly from the interior of said storage compartment through said opening, said member having at least one receptacle therein for receiving food items from the compartment, motive means drivingly connected to said member for rotating it about its axis to push food items carried in said receptacle from within said compartment outwardly through said opening for feeding purposes; said rotatably mounted member being a disc member, the vertical central axis of the disc member about which it rotates being disposed near said opening; said receptacle being an open notch therein for receiving food items falling therein within the compartment;

said member including a second receptacle spaced angularly from the first-mentioned receptacle, the receptacles being wedge-shaped open notches;

said motive means including an output shaft turning at the rate of one revolution per twenty-four hours;

said motive means being an electric motor;

said disc member being generally horizontally disposed and being generally circular in shape, said compartment being generally cylindrical and semi-circular in cross section throughout the axial length thereof; and

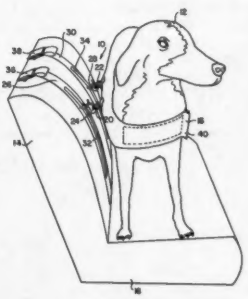
said housing having an outwardly flared hollow base portion surrounding said motor, said base portion having a front inwardly smoothly-contoured external dished portion disposed below and depending from said opening in said housing for guiding the stream of food items falling from said receptacles therein.

4,324,204

ANIMAL SAFETY RESTRAINT FOR VEHICLES

Michael E. Friedman, 428 Mount Olive Dr., Bradbury, Calif. 91010

Filed Aug. 18, 1980, Ser. No. 178,743
Int. Cl.[3] **A01K** *3/00, 27/00*
U.S. Cl. 119—96 **7 Claims**



1. A safety restraint for securing an animal to the seat of a vehicle comprising the combination of a pair of elongated elements adapted to be secured to the back of a seat of a vehicle in spaced-apart relation so as to be generally vertically disposed, a harness adapted to receive a substantial portion of the body of an animal and a pair of releasable fasteners coupled to different portions of the harness, each of the fasteners being adapted to be releasably fastened to a different one of the elongated elements, the pair of fasteners being coupled to the harness adjacent the center of the shoulder and the center of the flank of an animal received by the harness to confine the

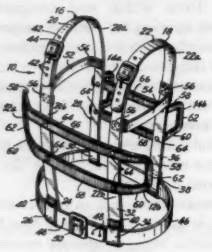
animal to positions in which the shoulder and the flank of the animal remain adjacent the back of a seat to which the pair of elongated elements are secured.

4,324,205

SAFETY HARNESS

Jerome Goldmacher, 12 Sheppard La., Stony Brook, N.Y. 11790

Filed Aug. 12, 1980, Ser. No. 177,290
Int. Cl.³ A62B *35/00*
U.S. Cl. 119—96 **12 Claims**



1. A safety harness adapted to be worn by a lead rider such as a motorcyclist or the like and adapted to be gripped by a pillion or tandem rider, said safety harness comprising:

elongated first and second strap members each having a central portion that is adapted to pass over the right and left shoulders, respectively, of the lead rider and front and rear strap portions that terminate at respective end portions proximate the right and left sides of the waist of the lead rider when the harness is being worn; and

a plurality of pairs of hand grip members, each of said hand grip members being integral with said front and rear strap portions at a location that is intermediate said central and said front and rear end portions thereof, respectively, to thereby define front and rear pairs of gripping members, when the harness is worn said front pair of gripping members being located proximate the chest of the lead rider and the rear pair of gripping members being located proximate the back of the lead rider,

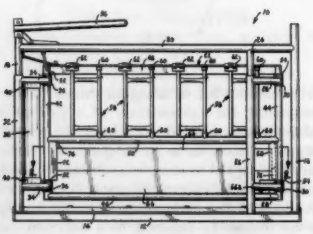
whereby with equal facility, the pillion rider may grasp either the front or the rear pairs of gripping members.

4,324,206

PANEL MOUNTING ARRANGEMENT FOR SQUEEZE CHUTES

Laurence B. Pearson, Thedford, Nebr., assignor to Pearson's Inc., Thedford, Nebr.

Filed Jul. 7, 1980, Ser. No. 166,342
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—99 **9 Claims**



1. In a livestock squeeze chute having a pair of spaced apart sides movable toward and away from one another for squeezing of an animal therebetween and a pair of generally vertical bars on at least one of the sides, the improvement comprising:

a panel having opposite ends and a length dimension less than the distance between the vertical bars;

a first pair of panel retaining elements on one of the bars spaced apart from one another sufficiently to receive one end of said panel therebetween;

a second pair of panel retaining elements on the other of the bars spaced apart from one another sufficiently to receive the other end of said panel therebetween;

said first and second pairs of retaining elements being spaced sufficiently to permit insertion of said one end of the panel into the space presented between said first pair of retaining elements and movement of said other end of the panel past an edge portion of one of the retaining elements in said second pair into alignment with the space presented between said second pair of retaining elements; and

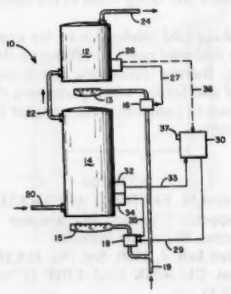
cam means for shifting said panel in a direction longitudinally of the panel to effect entry of said other end of the panel into the space presented between said second pair of retaining elements with said one end of the panel remaining between said first pair of retaining elements, whereby the retaining elements retain said panel on said at least one side of the squeeze chute.

4,324,207

ENERGY EFFICIENT WATER HEATER

John E. Leuthard, 8735 Penn Ave. South, Minneapolis, Minn. 55431

Filed Jul. 25, 1980, Ser. No. 172,088
Int. Cl.³ F22B *37/42*
U.S. Cl. 122—448 B **10 Claims**



1. Apparatus for heating hot water according to predetermined quantity and time allotments, comprising:

(a) a first water tank and heater coupled to a water source;

(b) first and second thermostats for sensing water temperature in said first water tank;

(c) a second water tank and heater coupled to said first water tank, and having a hot water outlet;

(d) third thermostat for sensing water temperature in said second water tank;

(e) first and second means for respectively energizing said first and second heaters;

(f) means for coupling said third thermostat to said second means for energizing, for controlling said second heater in response to said third thermostat; and

(g) a control network having timing means therein, coupled to said first thermostat and to said means for energizing said first heater, whereby said first thermostat controls said first heater during a first time interval and said second thermostat controls said first heater during a second time interval.

4,324,208
INTERNAL COMBUSTION ENGINE WITH A SOUND INSULATING CASING

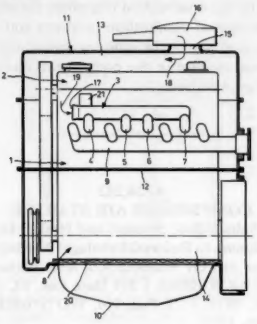
Hermann Danckert, and Helmut Leptien, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 952,488, Oct. 18, 1978, abandoned. This application May 21, 1980, Ser. No. 151,880

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2746896

Int. Cl.³ F02B *77/02*

U.S. Cl. 123—195 C **7 Claims**



1. In an engine comprising:

(a) an internal combustion engine having,

(1) at least one intake pipe for receiving air for combustion that has passed through an air filter,

(2) at least one fuel metering device, and

(3) at least one exhaust pipe; and

(b) a sound insulating casing with at least one air inlet opening, which encloses a space adjacent to said engine which includes the region of said intake pipe; the improvement wherein said casing is closed to the atmosphere with the exception of the said inlet opening, wherein an air filter is coupled to said inlet opening for filtering air passing through said inlet opening into the interior of said casing, wherein said intake pipe comprises an intake manifold within said casing, said manifold having a single air intake for supplying air to a plurality of cylinders, and wherein said inlet opening and the air intake of said intake manifold are arranged in such a manner that the air which flows between said inlet opening and said air intake passes over and cools parts of said engine which are to be cooled.

4,324,209
FUEL AND WATER HOMOGENIZER AND VAPORIZER AND METHOD THEREFOR

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 972,953, Dec. 26, 1978, Pat. No. 4,227,817. This application May 27, 1980, Ser. No. 153,612

Int. Cl.³ F02M *25/04*; F02B *47/02*

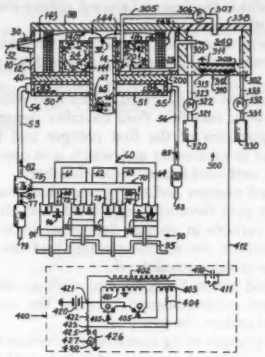
U.S. Cl. 123—25 B **14 Claims**

2. A fuel and water homogenizer, and a vaporizer fitted to an engine, said engine developing motive power, comprising the combination of:

homogenizing means for creating a fluid of homogenized liquid fuel and water, said homogenizing means including a vessel fed by said liquid fuel and water, and transducing means, retained by and located within said vessel, for transducing AC electrical energy to vibrations so as to convert said liquid fuel and water into said homogenized fluid;

fuel and water retaining means, coupled to said homogenizing means, for providing said liquid fuel and water to said homogenizing means; and

vaporizing means, coupled to the homogenizing means, for receiving said fluid, said vaporizing means including a compartment having diffusing means therein for vaporizing said fluid, the vaporized fluid combining with an air stream for injection into said engine.



4,324,210
HYDRAULIC VALVE LIFTER AND FLUID PRESSURE CONTROL DEVICE THEREFOR

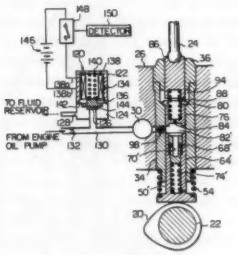
Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 9, 1979, Ser. No. 55,757

Claims priority, application Japan, Jul. 19, 1978, 53-88141; Feb. 20, 1979, 54-21493[U]

Int. Cl.³ F01L *1/14*

U.S. Cl. 123—90.55 **29 Claims**



2. A valve lift control apparatus for an internal combustion engine, comprising a source of fluid pressure variable with operating conditions of the engine and a hydraulic valve lifter which comprises:

a hollow, axially elongated stationary lifter cylinder structure;

a first plunger axially slideable in the lifter cylinder structure and projecting axially outwardly from one axial end of the lifter cylinder structure;

a second plunger axially slideable in the lifter cylinder structure substantially in line with the first plunger and projecting axially outward from the other axial end of the lifter cylinder structure;

a first piston axially movable between the first and second plungers and forming between the first plunger and the first piston a first fluid chamber continuously variable in volume depending upon the axial positions which the first plunger and the first piston assume relative to each other;

a second piston axially movable between the first piston and the second plunger and forming at least in part between

the first and second pistons a second fluid chamber continuously variable in volume depending upon the axial positions which the first and second pistons assume relative to each other; and

passageway means for providing communication between said source of fluid pressure and said second fluid chamber;

the first piston being formed with a hole which is communicable with said first fluid chamber depending upon the axial positions of the first plunger and the first piston relative to each other and which is in constant communication with said second fluid chamber;

the second plunger and the second piston having formed at least in part therebetween a third fluid chamber continuously variable in volume depending upon the axial positions which the second plunger and the second piston assume relative to each other;

the second piston being formed with an orifice providing constant communication between the second and third fluid chambers therethrough;

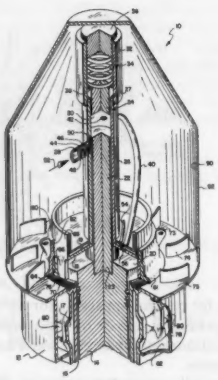
said first plunger being operative to obstruct and re-establish communication between said hole in said first piston and said first fluid chamber in such a manner that the valve lift and the valve timing of the valve are determined by the timings at which the communication between said hole in said first piston and said first fluid chamber are to be obstructed and re-established by said first plunger.

4,324,211

TORCH IGNITION APPARATUS AND METHOD

Grant H. Strong, Richland, Wash., and Kline D. Strong, Salt Lake City, Utah, assignors to Strong Research, Salt Lake City, Utah

Filed Oct. 26, 1979, Ser. No. 88,872
Int. Cl.³ F02B *19/06*
U.S. Cl. 123—143 A **11 Claims**



1. A torch ignition apparatus for an internal combustion engine comprising:

at least one combustion chamber of an internal combustion engine, the combustion chamber comprising a primary combustion chamber and being formed in a cylinder of the internal combustion engine between a piston cooperating in the cylinder and a cylinder head, the piston being operable to compress a first gaseous mixture of fuel and air in the primary combustion chamber;

intake means for introducing the first fuel and air mixture into the combustion chamber, the ratio of fuel to air being lower than necessary to sustain combustion of the first fuel and air mixture in the combustion chamber; and

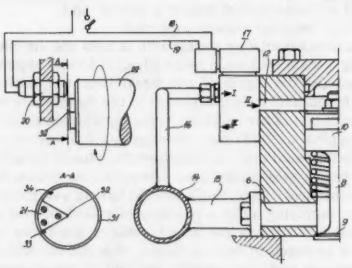
ignition means for igniting the first fuel and air mixture in the combustion chamber, the ignition means comprising a torch ignition piston extending coaxially from the piston and the ignition means comprises a torch ignition cylinder mounted to the cylinder head and receiving the torch ignition piston, the ignition means further comprising a torch ignition chamber formed in the torch ignition cylinder between the torch ignition piston and a spring-biased torch ignition floating piston, a second fuel and air intake means for introducing a second fuel and air mixture into the torch ignition chamber, and a torch tube extending between the torch ignition chamber and the primary combustion chamber, the torch tube directing the gaseous stream of combustion products from the torch ignition chamber to the combustion chamber, thereby injecting a gaseous stream of combustion products and a supplemental fuel heated above the ignition temperature of the first fuel and air mixture in the combustion chamber into the combustion chamber.

4,324,212

COMPRESSED AIR STARTER

Olof Samuel, Saltsjö-Boo, Sweden, and Heikki Hellemaa, Abo, Finland, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden and Oy Wartsila AB, Abo, Finland

PCT No. PCT/SE79/00086, § 371 Date Dec. 11, 1979, § 102(e) Date Dec. 5, 1979, PCT Pub. No. WO79/00917, PCT Pub. Date Nov. 15, 1979
PCT Filed Apr. 10, 1979, Ser. No. 174,792
Claims priority, application Sweden, Apr. 11, 1978, 7804073
Int. Cl.³ F02N *17/08*
U.S. Cl. 123—179 F **9 Claims**

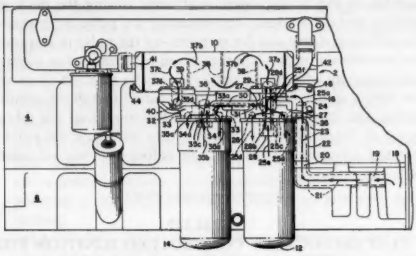


1. In a compressed air starter for diesel engines wherein a main starting valve is operably arranged in a cylinder head and includes a valve body, which co-operates with a valve seat for opening and closing an inlet for compressed air to the cylinder of the engine, compressed air during the starting operation continuously is supplied to the main starting valve and the valve body has a servo piston, which is controlled by servo air from a supply thereof through a servo supply channel, which servo air acts on the servo piston in correlation with the working phase of the engine, the improvement comprising a magnetic valve operatively connected in the servo supply channel to the main starting valve, said magnetic valve having a valve slide, which in one position connects the supply of servo air with one side of the servo piston to drive the valve body to open the inlet for compressed air to the cylinder, and which valve slide in a second position controls the supply of servo air so that the servo piston drives the valve body to close said inlet, and a transmitter controlled by means in synchronization with the engine crank shaft to emit electrical signals in response to the rotation thereof, said transmitter being operatively connected to said magnetic valve so that said electrical signals control said valve.

4,324,213
LUBRICATION FLUID FILTERING AND COOLING ASSEMBLY

Edward W. Kasting, Seymour; Richard E. Glasson, and Roy J. Primus, both of Columbus, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 21, 1980, Ser. No. 113,698
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 A 17 Claims



1. An oil cooler for an internal combustion engine having recirculating oil and coolant circuits, comprising:

(a) an open ended, elongated hollow shell;

(b) a plurality of open ended, elongated coolant flow tubes positioned within said hollow shell generally parallel to the longitudinal axis of said hollow shell;

(c) a pair of tube end support plates mounted adjacent each open end of said hollow shell for supporting said coolant flow tubes in a generally equally spaced apart distribution pattern throughout the interior of said hollow shell, said support plates being connected with one end, respectively, of all said flow tubes in a manner to fluidically seal the interior surface of each said coolant flow tube from its exterior surface except for passage around the radial perimeter of said tube end support plates, each said tube end support plate including an integral circumferential flange which extends axially outwardly beyond the ends of said hollow shell when assembled therewith;

(d) a pair of end caps shaped to be positioned adjacent the open ends of said hollow shell in a manner to form inlet and outlet coolant chambers, respectively, fluidically connected by the interiors of said coolant flow tubes, each said end cap being cup-shaped with the lip thereof being telescopically positioned over one of said integral flanges to contact directly the corresponding ends of said hollow shell and to form a butt joint with the corresponding ends of said hollow shell;

(e) inlet and outlet oil ports positioned in the side wall of said hollow shell for forming an oil flow path within said hollow shell between the exterior surfaces of said coolant flow tubes;

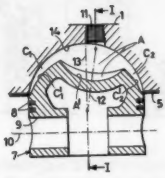
(f) inlet and outlet coolant flow ports positioned in said inlet and outlet coolant chambers, respectively, for forming a coolant flow path through said chambers and the interiors of said coolant flow tubes; and

(g) joining means for permanently bonding the radial perimeters of said support plates with the corresponding ends of said hollow shell to fluidically seal said inlet and outlet coolant chambers along the joined radial perimeters in a manner which prevents nondestructive disassembly of said end caps and said support plates from said hollow shell, wherein the adjacent portions of said hollow shell, said end caps and said support plates are formed of heat weldable material and wherein said joining means includes a circumferential zone of weld material simultaneously joining said butt joints with the corresponding subjacent portions of said corresponding flanges.

4,324,214
COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Feb. 26, 1980, Ser. No. 124,944
Claims priority, application Italy, Mar. 8, 1979, 20825 A/79
Int. Cl.³ F02F 3/28
U.S. Cl. 123—309 8 Claims



1. A combustion chamber for a cylinder of a reciprocating internal combustion engine of the type including an engine block defining a cylinder having a piston disposed therein for reciprocating movement, said piston having a pin bore for receiving a piston pin, and an engine head secured to said engine block, said head having formed therein intake and exhaust ducts for said cylinder, the inlet and exhaust valves having heads for selectively closing said intake and exhaust ducts, said combustion chamber lying between a wall provided in said engine head in which are seatable said heads of said inlet and exhaust valves and a crown of said piston, said wall provided in said engine head being essentially in the form of a spherical cup, said combustion chamber being characterised in that said piston crown comprises five wall portions of which:

a first wall portion and a second wall portion are fundamentally convex and form part of a surface in the form of a spherical cap having its center on the piston axis at a point displaced downwards from the center of said spherical cup provided in said head, said first and second wall portions being disposed in proximity to the piston periphery in positions corresponding with the ends of a piston diameter which is parallel to the piston pin bore axis, the surface of one of said first and second wall portions being greater than the surface of the other of said first and second wall portion;

a third wall portion and a fourth wall portion are fundamentally flat and are disposed in proximity to the piston periphery respectively below said inlet valve head and said exhaust valve head, said third and fourth wall portions being joined to said first and second wall portions;

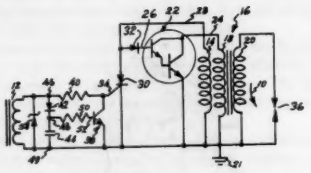
a fifth wall portion fundamentally in the form of a concave cap of a solid of rotation having an axis of symmetry skew to the cylinder axis, said fifth wall portion being disposed in a central part of said piston crown and being joined to said first, second, third and fourth wall portion, the volume of said combustion chamber with the piston at a top dead center position having a greatest thickness in a zone in contact with said fifth wall portion of said piston crown, having an intermediate thickness in zones in contact with said third and fourth wall portions of said piston crown, and having a smallest thickness in zones in contact with said first and second wall portions of said piston crown; and

a sparking device carried by said engine head and having a sparking point in said combustion chamber, said sparking point lying in a plane passing through said piston pin bore axis and said cylinder axis and being offset to one side of said cylinder axis.

4,324,215
ENGINE SPEED LIMITING CIRCUIT

Norman F. Sieja, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Apr. 30, 1980, Ser. No. 145,116
Int. Cl.[3] F02P 1/00; F02A 1/00
U.S. Cl. 123—335 9 Claims

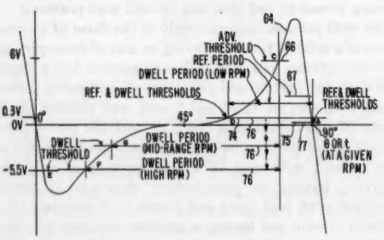


1. A speed limiting circuit for a magneto ignition system for an engine, including a rotating magnetic field, comprising:
- an ignition coil;
- a secondary winding of said ignition coil being operably connected to a spark plug;
- a primary winding of said ignition coil being magnetically coupled to said secondary winding and having a current therein induced by said magnetic field;
- switching means connected to said primary winding for switching said current to cause an ignition pulse at said spark plug;
- latching means operatively connected to said switching means for controlling said switching means;
- a trigger coil means responsive to said magnetic field and being operably connected to said latching means for providing a trigger signal for energizing said latching means;
- shorting means operably connected to said latching means and to said trigger coil means, and responsive to said trigger signal, for shorting said trigger signal for a predetermined interval following a first said trigger signal, to prevent a second said trigger signal within said predetermined interval from being effective to energize said latching means.

4,324,216
IGNITION CONTROL SYSTEM WITH ELECTRONIC ADVANCE

Nicky M. Johnson, Los Altos, and Lawrence M. Blaser, Mountain View, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jan. 9, 1980, Ser. No. 110,736
Int. Cl.[3] F02P 5/08, 5/04
U.S. Cl. 123—415 13 Claims

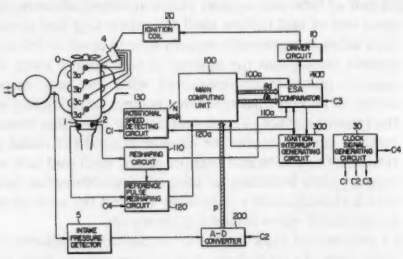


1. An ignition control system connectable between a sensor responsive to rotation of a rotating element for repetitively supplying an analog timing signal and an ignition coil in which a current pulse repetitively flows, the timing signal consisting of an increasing portion during which its amplitude rises as a function of time from a minimum value substantially continuously to an intermediate value and then from the intermediate value substantially continuously to a maximum value and a subsequent decreasing portion during which its amplitude drops as a function of time immediately from the maximum value substantially continuously to a minimum value, the system having dwell means responsive to the timing signal for generating an initiation signal at a first selected time when a first specified relationship to the timing signal is attained during the increasing portion and for generating a termination signal at a second selected time when a second specified relationship to the timing signal is attained during the decreasing portion and drive means for initiating the pulse in response to the initiation signal and for terminating the pulse in response to the termination signal, characterized by: comparing means for generating an advance signal between the selected times when the timing signal reaches a predetermined threshold amplitude during the increasing portion and for supplying the advance signal to the drive means to cause it to terminate the pulse at a selected advance period of time before the second selected time.

4,324,217
ELECTRONICALLY CONTROLLED IGNITION FOR INTERNAL COMBUSTION ENGINES

Toshikazu Ina, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 27, 1979, Ser. No. 97,661
Claims priority, application Japan, Dec. 7, 1978, 53-152336
Int. Cl.[3] F02P 5/04
U.S. Cl. 123—417 6 Claims



1. An ignition system for an internal combustion engine having a rotatable output shaft comprising:
- an ignition coil energized and de-energized in synchronized relation with a first and second timing signals, respectively, to generate ignition voltages;
- a position detector for generating a reference position signal at every arrival of said output shaft at a predetermined reference position;
- a periodic pulse generator for generating periodic pulsed signals in each period of time between two successive reference position signals;
- a digital computer being programmed to compute a first and second values in synchronized relation with said reference position signal and said first timing signal, respectively, said first value being indicative of the desired ignition coil energization starting timing and computed by using said second value so that an ignition coil energizing period is kept at a desired value, and said second value being indicative of the desired coil de-energizing timing and computed to vary in accordance with operating conditions of said internal combustion engine;
- a latch for sequentially latching said computed first value and said computed second value at the respective timings when the computation of the first and second values is completed in said digital computer;
- counter means for counting said periodic pulse signals after being reset in synchronized relation with said reference position signal; and

a comparator for sequentially comparing the count output of said counter means with said latched first and second values, said comparator generating said first timing signal to be supplied to said ignition coil and said digital computer when said count output reaches said latched first value and then generating said second timing signal to be supplied to said ignition coil when said count output reaches said latched second value.

6. A method of controlling the generation of an ignition voltage by an ignition coil of an internal combustion engine having an output shaft, said method comprising the steps of:

detecting the arrival of said output shaft of said internal combustion engine at a predetermined rotational position and then generating a reference position signal;

generating a train of periodic signals;

initiating, in response to said reference position signal, the counting by counter means of said periodic signals;

initiating, in response to said reference position signal, the computation by programmed digital computer means of a first delay period between said predetermined position and a desired ignition coil energization starting position to generate a first digital value indicative of said first delay period;

storing said first digital value in storage means of said computer means after the completion of computation of said first delay period;

generating a first signal when the count of said counter means reaches said stored first digital value;

intiating, in response to said first signal, the energization of said ignition coil;

initiating, in response to said first signal, the computation by said programmed digital computer means of a second delay period between said predetermined position and a desired ignition coil de-energizing position to generate a second digital value indicative of said second delay period;

storing said second digital value in said storage means of said computer means in place of said first digital value after the completion of computation of said second delay period;

generating a second signal when the count of said counter means reaches said stored second digital value;

initiating, in response to said second signal, the de-energization of said ignition coil to generate said ignition voltage; and

repeating the sequential operations of the above-described steps.

4,324,218

AIR-FUEL RATIO DETECTING SYSTEM

Tadashi Hattori, Okazaki, and Yoshiki Ueno, Aichui, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 18,776, Mar. 8, 1979, abandoned. This application Oct. 23, 1980, Ser. No. 199,922

Claims priority, application Japan, May 30, 1978, 53-64710; Jun. 14, 1978, 53-71623

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.[3] **F02B** *3/08;* **F02D** *5/00*

U.S. Cl. 123—440 **18 Claims**

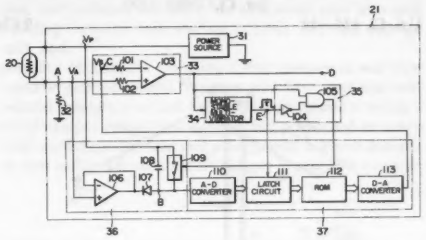
1. An air-fuel ratio detecting system for internal combustion engines comprising:

oxygen detecting means disposed in an exhaust passage of an internal combustion engine for detecting a presence and an absence of oxygen, said oxygen detecting means exhibiting a low resistance and a high resistance in response to said absence and said presence of oxygen respectively;

resistor means connected in series with said oxygen detecting means;

voltage supplying means for supplying a series circuit of said oxygen detecting means and said resistor means with a voltage so that a first and a second voltages are developed at a junction between said oxygen detecting means and said resistor means in response to said low resistance and said high resistance of said oxygen detecting means, respectively;

sampling means for sampling a peak value of at least one of said first and second voltages during a sampling period;



reference establishing means for establishing a reference value related to said sampling peak value of said at least one of said first and second voltages; and

comparing means for comparing said first and second voltages with said reference value.

4,324,219

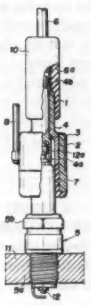
SPARK INTENSIFIER IN GASOLINE ENGINE

Mikio Hayashi, Tokyo, Japan, assignor to Hayashi Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 12,828, Feb. 16, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 168,528

Int. Cl.[3] **F02P** *15/00*

U.S. Cl. 123—620 **2 Claims**



1. A spark intensifier for gasoline engines comprising an insulating cylinder made of a material with excellent heat-resisting and insulating properties and high permittivity, a metallic outer cylinder sheathing said insulating cylinder, a grounding member connected to said outer cylinder, a metallic inner cylinder disposed in said insulating cylinder, and a terminal shaft secured at its central portion to said insulating cylinder and electrically connected to said inner cylinder, said terminal shaft being also electrically connected at its foremost end to a plug cord and at its lower end to a spark plug having a discharge shaft, the said three cylinders comprising a capacitor intermediate the spark plug and the plug cord and in parallel with the discharge shaft of the spark plug, whereby the discharge current of the capacitor is combined with the spark current of the spark plug at the time of sparking, and wherein an insulating end cylinder is surrounded by the lower portion of said insulating cylinder for insertion over the end of the spark plug, the upper end of the insulating end cylinder contacting the metallic inner cylinder and the lower end of the insulating end cylinder contacting said insulating cylinder.

4,324,220

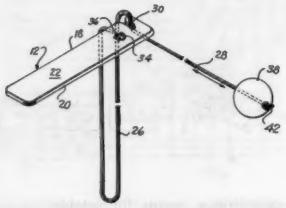
SLINGSHOT-LIKE TETHER TOY

Ronald Joelson, R.R. 1, Chetek, Wis. 54728

Continuation-in-part of Ser. No. 926,739, Jul. 21, 1978, abandoned. This application Mar. 19, 1979, Ser. No. 22,217

Int. Cl.³ F41B 7/00

U.S. Cl. 124—18 **9 Claims**



3. A toy which comprises:

a handle;

a projectile means for impacting a target;

a single elastic cord connecting said handle to said projectile means, said elastic cord projecting said projectile means in a path substantially nonparallel to the longitudinal axis of said handle means;

a stop positioning means located on said handle and adapted to engage a stop means;

a stop means positioned along said elastic cord between said handle and said projectile means to catch said elastic cord by engaging said stop positioning means, wherein said handle comprises an elongated handle member having a pair of opposed side surfaces and a pair of edge surfaces connecting said side surfaces, a slot forming said stop positioning means passing through said handle member from one side surface to the other at one end of said handle member and intersecting one edge surface, there being a blind bore in said handle member through one edge, and a hole passing through said handle member intersecting said bore, said elastic cord being connected to said handle member by a passage at one of its ends into the bore which end is knotted and the knot being seated in said hole.

4,324,221

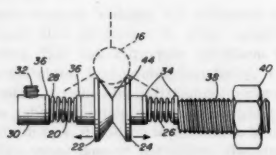
ARROW REST FOR ARCHERY BOW

Paul L. Peck, Box 427, Bryantville, Mass. 02327

Filed Jul. 7, 1980, Ser. No. 166,152

Int. Cl.³ F41B 5/00

U.S. Cl. 124—24 R **11 Claims**



1. An arrow rest for use with an archery bow having a window area, the arrow rest adapted to receive an arrow, and which arrow rest comprises:

(a) a first shaft element adapted to be secured to the archery bow about the window area and to extend generally perpendicularly therefrom;

(b) first and second facing elements slidably mounted for axial, reciprocating movement on the first shaft element, the first and second elements having opposing facing surfaces which define an arrow-receiving notch therebetween, to support an arrow to be propelled by the archery bow;

(c) tension means to bias and urge the first and second facing elements toward each other; and

(d) means to secure the shaft element to the window area of the archery bow, whereby shocks and vibrations occasioned by the vertical and lateral movements of the arrow, during release of the arrow from the bow, will be dampened, as the arrow passes through the arrow-receiving notch of the arrow rest through outward movement of the biased facing elements on the shaft.

4,324,222

VIBRATION DAMPENED FOR ARCHERY BOW

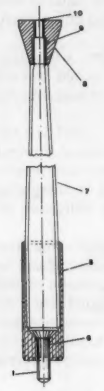
Max Gasser, Neugasse 35, 9442 Berneck, Switzerland

Filed Jul. 24, 1979, Ser. No. 60,133

Claims priority, application Switzerland, Mar. 28, 1979, 2853/79

Int. Cl.³ F41B 5/00

U.S. Cl. 124—89 **7 Claims**



1. A stabilizing device for an archery bow comprising:

(a) an elongated conical member;

(b) a sleeve having longitudinal grooves in the exterior surface thereof, said sleeve being pressed onto the proximal end of said elongated member over the outer surface thereof and forming a rigid connection therebetween with said grooves being exposed exteriorly of said elongated member;

(c) screw means, secured to said sleeve and including means for preventing rotation relative to said sleeve, for securing the proximal end of said elongated member to a bow and forming a substantially vibration-free connection therebetween;

(d) a terminal weight member having a self-cutting threaded portion whereby said terminal member is threadably connected to the distal end of said elongated member by relative rotation therebetween forming a substantially vibration-free connection;

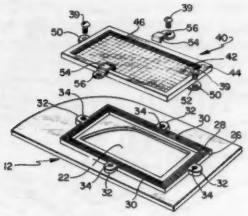
(e) said elongated conical member tapering from wide to narrow in the direction of the proximal end to the distal end; and

(f) said sleeve having a sufficient length and said grooves being so presented on the exterior surface thereof to facilitate tight threading of the screw means by hand whereby a vibration-free connection is formed between said elongated member and said bow by manually threading said screw means into a bow.

4,324,223
STOVE DOOR CONSTRUCTION

Larry A. Schwartz, Warwick, R.I., assignor to Franklin Industries, Inc., Warwick, R.I.

Filed Dec. 30, 1980, Ser. No. 221,382
Int. Cl.³ F23M *7/00*
U.S. Cl. 126—200 **1 Claim**



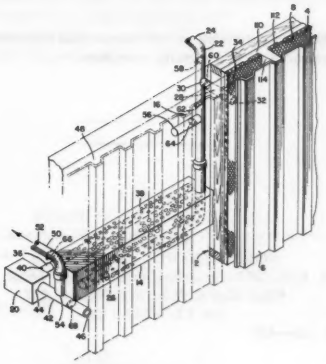
1. A door for wood burning stoves and the like comprising
a. a metallic door having a central opening therein;
b. a raised channeled boss formed on the rear side of said door spaced from said opening and extending substantially thereabout;
c. a gasket positioned substantially within said channel and extending substantially around said opening;
d. a plurality of raised mounting posts formed on the rear side of said door adjacent to said boss and spaced around the periphery thereof, each of said posts being raised from the rear surface of said door substantially the same amount as said boss and each having threaded central openings therein;
e. a transparent panel of substantially the same peripheral dimension and configuration as said boss positioned in pressurized engagement with said gasket thereby effecting a cushioned seal between said panel and said boss;
f. a plurality of tabs extending outwardly from the periphery of said panel and positioned therearound to correspond to the positions of at least a portion of said posts around said boss, each of said tabs having central openings therein; and
g. a plurality of bolt means extending through said openings in said tabs and being received in at least a portion of said openings in said posts in threaded engagement therewith to thereby secure said panel to said door.

4,324,224
TEMPERATURE CONTROL SYSTEM

Howard E. Cox, Rte. #2, Box 215c, Hoopeston, Ill. 60942, and Dale L. Rush, P.O. Box 4, Wellington, Ill. 60973

Filed Dec. 10, 1979, Ser. No. 101,568
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **3 Claims**

1. A temperature control system for a building comprising
a solar collector comprising a heat absorbing panel, a transparent panel spaced from said heat absorbing panel, and an air channel therebetween, said panels extending substantially coextensive with at least a portion of at least one vertical wall of said building;
a heat storage unit;
a plurality of conduits and an air handler for circulating air through said collector and storage unit during a collecting mode at a first predetermined temperature, for exhausting air from said collector and storage unit during a dumping mode at a second predetermined temperature, and for causing air flow through said storage unit into said building during a heating mode at a third predetermined temperature, said plurality of conduits comprising a first conduit one end of which forms a first vent into said building and the other end of which vents into said storage unit, a second conduit one end of which vents into said first conduit and the other end of which vents into one end of said air channel, a third conduit one end of which vents into said storage unit and the other end of which vents into said air handler, a fourth conduit one end of which vents into said air handler and the other end of which vents into the opposite end of said air channel, and a fifth conduit one end of which forms a second vent into said building and the other end of which vents into said fourth conduit, said first conduit including an additional vent into said building between said second conduit and said storage unit; and,
a plurality of dampers including a first damper in said first conduit and positioned between said first vent and said second conduit, a second damper in said second conduit, a third damper in said first conduit and positioned between said second conduit and said storage unit, a fourth damper in said additional vent, a fifth damper in said fifth conduit,



and a sixth damper in said fourth conduit and positioned between said fifth conduit and said air channel, each of said six dampers including a damper motor, said second, third and sixth motors being electrically coupled to a first relay, said first, second, fourth and sixth motors being electrically coupled to a second relay, and said first, third and fifth motors being electrically coupled to a third relay, at least one of said relays being electrically coupled to said air handler in said collecting, heating and dumping modes, and each of said relays being electrically coupled to means for energizing said relays at predetermined temperatures to cause said dampers and said air handler to selectively move to opened and closed positions during said collecting, heating and dumping modes.

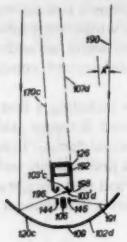
4,324,225
SOLAR TRACKING DEVICE

John M. Trihey, 241 Bayswater Rd., Bayswater, Victoria, Australia

Continuation-in-part of Ser. No. 704,674, Jul. 12, 1976, Pat. No. 4,089,323. This application Mar. 3, 1978, Ser. No. 883,313
Claims priority, application Australia, Jul. 11, 1975, PC2334; Apr. 21, 1977, PC9839
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—425 **70 Claims**

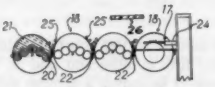
25. Solar conversion apparatus comprising:
concentrating means, including a reflective surface, for concentrating solar energy onto at least one surface,
tracking means for causing the concentrating means to track the sun,
said tracking means including first and second elongate metallic members which are dispose relative to the concentrating means to receive solar energy from said reflective surface to be differentially heated by solar energy when the concentrating means is misaligned with the sun, the differential heating of said metallic members produc-

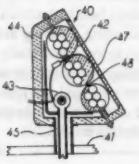
ing differential thermal linear expansions thereof and drive means for producing tracking movements of said



concentrating means in response to said differential linear expansions of said metallic members.

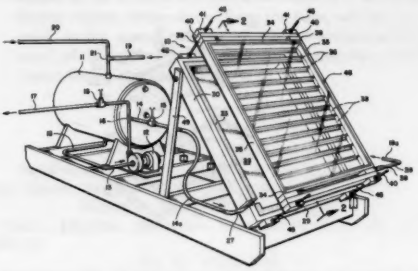
4,324,226
SOLAR ENERGY APPARATUS
James A. Beck, 3530 St. Johns Ave., Billings, Mont. 59102
Filed May 8, 1980, Ser. No. 147,937
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **3 Claims**





1. Apparatus for absorbing solar energy including a plurality of energy absorbing members, said energy absorbing members being arranged substantially parallel to and closely adjacent to each other in a row, each energy absorbing member having a generally cylindrical configuration and including a mass of solar energy absorbing material extending substantially to the edges thereof, said energy absorbing material being contained within a plurality of elongated tubes within said energy absorbing members, insulating material disposed on one side of said energy absorbing material, supporting means for said energy absorbing members including frame means providing a unitary assembly, sealing means disposed between adjacent energy absorbing members, said frame means including a housing, said housing including air circulating means associated with said energy absorbing members, means for interconnecting said energy absorbing members, means for moving said interconnected energy absorbing members in a coordinated manner from an energy absorbing position to an energy radiating position; whereby air flows through said housing and around said energy absorbing members.

4,324,227
SOLAR HEAT COLLECTING PANEL
John F. Mountain, 1175 Norton, Idaho Falls, Id. 83401
Filed Sep. 6, 1979, Ser. No. 73,094
Int. Cl.³ F24J 3/02
U.S. Cl. 126—437 **3 Claims**



1. A solar heat collection and storage system, comprising a solar panel unit for heating circulating fluid, including a heat-absorbing body having an enclosed channel therethrugh for passage of heat exchange fluid, said passage having an inlet end and an outlet end, structure supporting said heat absorbing body, a plurality of lenses for focusing the sun's energy, and structure supporting said lenses in relation to the heat-absorbing body so that sunlight striking said lenses is focused upon said body; means for positioning said panel unit so that sunlight falls upon said lenses; a storage tank for heat-exchange fluid; heat storage means within said storage tank; first conduit means for connecting said storage tank with the inlet for said passageway in the heat absorbing body so that fluid to be heated is directed to the heat absorbing body; second conduit means connecting said first conduit means to external equipment which can utilize heated fluid; third conduit means for connecting said storage tank with the outlet for said passageway to return heated fluid to the storage tank; fourth conduit means connecting the external equipment to either the storage tank or the third conduit means, for returning fluid from the external equipment to the storage tank; pump means in the first conduit for forcing fluid from the tank through the first conduit; first control valve means located in the first conduit between the connection to said second conduit means and the inlet to the passageway; second control valve means located in the second conduit; and control means for opening said first valve when the temperature of the fluid toward the outlet of the passageway is greater than the temperature of the fluid leaving the storage tank, for opening the second valve when fluid is needed by the external equipment, and for causing operation of the pump means whenever one of the valves is open.

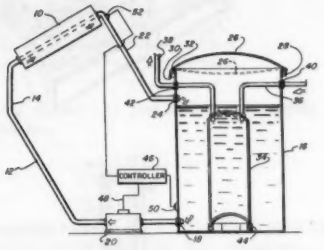
4,324,228
SOLAR HEATING APPARATUS
Paul Shippee, 934 Pearl St., Boulder, Colo. 80306
Filed Aug. 11, 1980, Ser. No. 176,785
Int. Cl.³ F24J 3/02
U.S. Cl. 126—437 **1 Claim**

1. A solar energy heating apparatus including a solar collector for use in raising the temperature of a solar energy working liquid moving through the solar collector, comprising:

a variable volume outer tank in the path of movement of the solar energy working liquid for containing the solar energy working liquid, said outer tank having a top portion, a bottom portion, a body wall and including an expandable lid having an underside, said expandable lid being removably and sealably fastened to said top portion of said outer tank, an air space being defined between the level of the solar energy working liquid in said outer tank and said underside of said lid, said lid being expandable to accom-

modate increasing pressure within said outer tank resulting from increases in temperature of the solar energy working liquid in said outer tank;

an inner tank heat exchanger completely contained within said outer tank and completely surrounded by the solar energy working liquid but impervious thereto, said inner tank being entirely rigid and having a substantially greater thickness than said outer tank to withstand the input of pressurized fluid to said inner tank, said inner tank having an inlet member for receiving a fluid and an outlet member for discharging the fluid, said inlet member and said outlet member each extending through said body wall of said outer tank, the temperature of the fluid contained in said inner tank depending upon the temperature of the solar energy working liquid;



means connected to said outer tank for conveying the solar energy working liquid from said bottom portion of said outer tank through the solar collector and for conveying the solar energy working liquid from the solar collector to said top portion of said outer tank to provide a circuitous path for the solar energy working liquid, said conveying means including a channel having an outlet end from which the solar energy working liquid exits into said outer tank, the vertical distance from said outlet end to an uppermost vertical portion of said channel being less than the vertical distance from said uppermost vertical portion to the level of the solar energy working liquid housed in said outer tank; and

means connected to said conveying means for driving the solar energy working liquid through said conveying means.

4,324,229

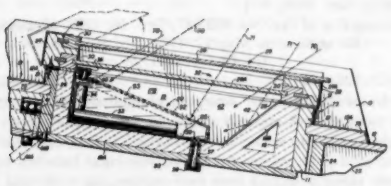
SOLAR COLLECTOR AND HEAT AND COLD GENERATOR

James A. Risser, 8244 E. Buena Terra Way, Scottsdale, Ariz. 85253

Continuation-in-part of Ser. No. 855,213, Nov. 28, 1977, abandoned. This application Nov. 19, 1979, Ser. No. 95,341

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—439 **10 Claims**



1. A compact solar heat generator, useable in a predetermined range of latitudes, comprising:

(a) a frame having an open top, insulated bottom and side walls defining a chamber, said frame having interior reflective faces for receiving and redirecting solar rays to a location within the chamber;

(b) a closed container having a wall and at least one surface permitting passage of solar rays and at least one heat generating surface at or adjacent said container wall, said one surface being oriented relative to said top and said reflective surface to receive through said one surface both direct and reflected solar rays to transfer energy to the interior of said container, said container being thermally insulated from the generator surroundings and positioned within said chamber at said location and further having fluid inlet and outlet ports for circulating a fluid to be heated through said container;

(c) a transparent cover for said frame secured to said frame, said cover and frame inclined to be approximately normal to the sun's rays when mounted; and

(d) said frame being mountable at a given angular position for receiving solar rays.

4,324,230

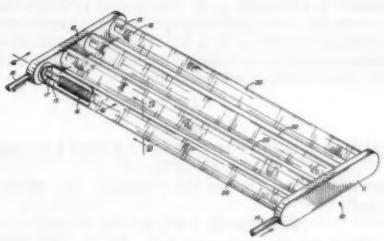
SOLAR COLLECTOR PANEL

Oscar M. Lunsford, Rte. 2, Box 496, Palm Springs Dr., Longwood, Fla. 32750

Filed Jul. 14, 1980, Ser. No. 168,595

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—443 **7 Claims**



1. A solar collector panel comprising in combination:

a pair of manifolds;

conductive tube means fixedly connected between said pair of manifolds to support said manifolds in space relationship to each other and being filled with a heat storage material;

helically wound tube means having at least one helically wound tube around one fixed tube of said spaced conductive tube means and operatively connected at each end to one of said manifolds to create a passageway from one manifold to the other;

transparent sleeve means having at least one sleeve mounted over said conductive tube having a helically wound tube wrapped therearound to provide a space between said helically wound tube and said sleeve, said sleeve being connected between said pair of manifolds;

reflective means located adjacent said transparent sleeve means to provide a reflective surface over a portion of said transparent sleeve means; and

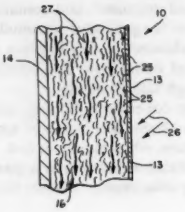
input and output means, said input means connected to one manifold to feed a liquid thereto and said output means connected to said other manifold to feed a liquid therefrom, whereby a solar collector panel can be made with one or more collector units of different capacities.

4,324,231

SOLAR COLLECTOR PANELS HAVING COATED FIBROUS FILLING FOR FIRE INHIBITION

Charles P. Reinert, Garvin, Minn., assignor to Solarein, Inc., Buffalo, Minn.

Filed Nov. 28, 1979, Ser. No. 98,062
Int. Cl.³ F24J 3/02
U.S. Cl. 126—449 **2 Claims**



1. A solar heat collector formed of a low density porous mat of fibers which are adapted to absorb radiant energy when placed into a chamber, and are spaced sufficiently to permit flow of fluid through the mat, and said heat collector including means forming a chamber containing said mat and having a fluid inlet and a fluid outlet wherein said chamber is oriented so that the inlet and the outlet are vertically spaced from each other and which are spaced from each other to permit fluid flow through the spaces in the mat from the inlet to the outlet, and a coating of intumescent paint on substantial surfaces of the fibers along substantial portions of the entire length of the chamber between the inlet and the outlet, said coating being applied in a quantity to be effective to constrict the spaces between the individual fibers upon being subjected to elevated temperatures such as in a fire, and to substantially increase resistance to air flow between the inlet and outlet by blocking the spaces between individual fibers.

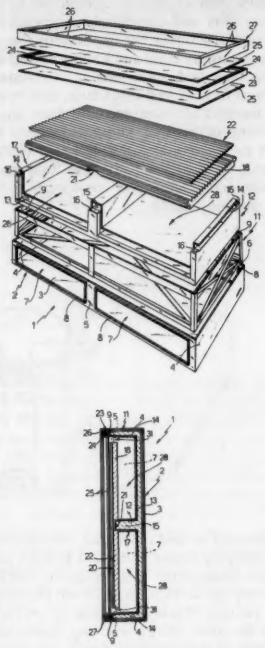
4,324,232

SOLAR PANEL, PARTICULARLY FOR FACADES OF BUILDINGS

Gabriella Quiroz, Strada Val Pattonera, 187, 10100 Torino, Italy

Filed Jul. 28, 1980, Ser. No. 173,187
Claims priority, application Italy, Jul. 27, 1979, 68566 A/79
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **8 Claims**

1. A solar panel comprising a substantially parallelepiped housing having a bottom wall and a transparent cover opposite the bottom wall, an absorber slab and an insulated body in the housing confronting one another and lying parallel with the bottom wall of the housing in order to form a first cavity between the transparent cover and the slab, the first cavity having air inlet and outlet openings, the slab and body also forming second and third cavities disposed side by side under the whole of said first cavity, each of said second and third cavities communicating with said first cavity through one of said openings, and the second and third cavities forming channels for the inlet and outlet of air into and from the solar panel, said absorber slab being traversed by the air crossing through said first cavity, wherein said body is substantially E-shaped and has a bottom wall, two sidewalls, and a central rib parallel with the said two sidewalls and separating said second and third cavities and connecting said slab with said body, wherein the slab has a length slightly smaller than the length of said body so as to define said inlet and openings, wherein said housing comprises two opposite sidewalls perpendicular with said rib and having formed thereon two rectangular perforations communicating with the said second and third cavities, wherein each of the said cavities has a rectangular contour, the perforations of one of the said sidewalls of the housing being adapted to be connected by the perforations of one of the said sidewalls of the housing of an adjacent, solar panel so as to connect the said channels to one another, and sealing means



comprising folded rims of the said perforations for connecting adjacent solar panel housings.

4,324,233

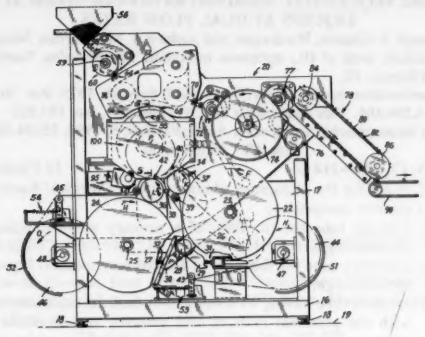
FEED ARRANGEMENT FOR AND METHOD OF CONTINUOUSLY FEEDING CIGARS WRAPPERS TO CIGAR WRAPPING STATIONS OF CIGAR WRAPPING MACHINES

Robert J. Baier, West Chester, and Edward W. Glatfelter, Newtown Square, both of Pa., assignors to Gulf & Western Corporation, New York, N.Y.

Continuation of Ser. No. 973,037, Dec. 26, 1978, abandoned. This application May 12, 1980, Ser. No. 148,924
Int. Cl.³ A24C 1/28
U.S. Cl. 128—58 **5 Claims**

1. In an apparatus for wrapping elongated cigar wrappers, each having a tuck end and a flag end, around elongated cigar bunches including means for conveying cigar wrappers along a first feed path; means for conveying cigar bunches transversely along a second feed path converging with said first path at a wrapping section where said paths generally match each other; said bunch conveying means including a plurality of independently driven, conveyed nests; means for applying an adhesive onto said tuck ends of said wrappers as they move along said first path toward said wrapping section, the im-

provement comprising: means for lifting said adhesive carrying tuck ends of said wrappers into engagement with said bunches



in said wrapping section and preparatory to wrapping by rotating said bunches.

4,324,234

DUAL CHAMBER PERSONAL FLOTATION DEVICE

Samuel G. Maness, 13008 Sturbridge Rd., Woodbridge, Va. 22192

Filed May 21, 1980, Ser. No. 152,002
Int. Cl.³ A62B *7/00*; B63C *11/00*
U.S. Cl. 128—202.14 **2 Claims**

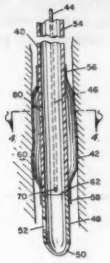
1. A dual chamber personal flotation device comprising: a flexible inflatable air-tight container designed to fit around the neck of the wearer; a flexible elastic air-tight membrane within said container dividing said container into two chambers; means for independently inflating said two chambers; and means for allowing the wearer to breathe the contents of one of said two chamber, said means for allowing the wearer to breathe the contents of one of said two chambers comprising a flexible tube attached at one end to said one chamber and having a combination mouthpiece-shutoff valve at its other end, said combination mouthpiece-shutoff valve comprising a stationary tubular central member, a sliding outer member surrounding said central member and capable of being in either an open or a closed position, a set of flow passages in said sliding outer member, sealing means in said outer member cooperating with said inner member to prevent flow through said flow passages when said outer member is in the closed position, and a mouthpiece on said outer member wherein said valve has means for urging said outer member to said closed position and means for holding said outer member in said open position.

4,324,235

ENDOTRACHEAL TUBE

Anthony V. Beran, 3802 Teakwood, Santa Ana, Calif. 92707

Filed Mar. 24, 1980, Ser. No. 133,014
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—207.15 **3 Claims**



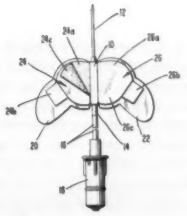
1. An endotracheal tube comprising, in combination:
a tube having a given outside diameter;
a tube end having an outside diameter corresponding substantially to said given outside diameter bonded end-to-end to one end of said tube such that axes of the tube end and the tube are substantially coincident in the region of the bond;
said tube end having been formed by being molded of a material which is non-transparent to X-rays;
said endotracheal tube being formed with an inflatable cuff including upper and lower sleeves each bonded to said endotracheal tube at respectively associated spaced regions along the length thereof; and
said lower sleeve being bonded to said endotracheal tube at the junction of said tube and said tube end such that the lower sleeve is bonded both to the tube and to the tube end.

4,324,236

FITTING FOR USE IN PERFORMING A VASCULAR PUNCTURE

Marvin Gordon, East Windsor, and Joseph Lichtenstein, Cononia, both of N.J., assignors to Whitman Medical Corp., Clark, N.J.

Filed Dec. 3, 1979, Ser. No. 99,926
Int. Cl.³ D61M *5/00*
U.S. Cl. 128—214 R **11 Claims**



1. A fitting for use in forming a vascular puncture comprising an elongate hub having a longitudinal axis, a blood vessel-entering element extending axially from one end of said hub, tubing attachment means at the other end of said hub and means for stabilizing the fitting on a patient's skin upon insertion of said blood vessel-entering element into a blood vessel, said stabilizing means including first and second substantially laminar wings extending laterally from said hub on opposite sides of said axis respectively, a third substantially laminar

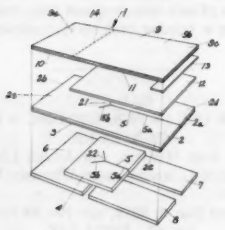
wing extending laterally from said hub under one of said first and second wings, each of said first, second and third wings being capable of independent flexing movements about said hub and said third wing having an undersurface with contact adhesive means covering a portion of said surface, wherein said undersurface of said third wing comprises a hub-covering portion, an outer gripping portion and a central portion between said hub-covering portion and said gripping portion and wherein said contact adhesive is provided on said central portion.

4,324,237

INTRAVENOUS CATHETER AND TUBING SECUREMENT AND DRESSING DEVICE WITH A WINDOW OVER THE PUNCTURE OR WOUND SITE

Philip M. Buttaravoli, Potomac, Md., assignor to E-Med Corporation, Cincinnati, Ohio

Filed Feb. 26, 1980, Ser. No. 124,859
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R **31 Claims**



1. A dressing device to cover a desired site on the skin of a patient, said dressing device comprising a base strip having upper and lower surfaces, an adhesive coating on said lower surface of said base strip to attach said base strip to said skin of the patient adjacent said site, access means in said base strip to said site, an elongated cover strip having upper and lower surfaces, a first portion of said cover strip being affixed to said upper surface of said base strip spaced from said access means, a second portion of said cover strip being releasably and resealably affixable to said base strip upper surface by releasable and resealable adhesive applied to one of said lower surface of said cover strip and said upper surface of said base strip, said cover strip being shiftable between a closed position adhered to said upper surface of said base strip and covering said access means in said base strip and an open position exposing said access means, and a gauze pad affixed to the underside of one of said base strip and said cover strip so as to contact said site when said cover strip is in said closed position and to expose said site when said cover strip is in said open position.

4,324,238

EQUIPMENT SETS HAVING A COMBINED AIR BARRIER AND LIQUID SEQUENCING DEVICE FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES

Joseph N. Genese, Waukegan, and Andrew J. Muetterties, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 16,461, Feb. 28, 1979, Pat. No. 4,256,104. This application Jun. 9, 1980, Ser. No. 157,922
Claims priority, application Australia, Feb. 5, 1980, 55234/80
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 G **12 Claims**

1. A set for the sequential administration of medical liquids to a patient, comprising:

a primary tube for the flow of a primary medical liquid therethrough,

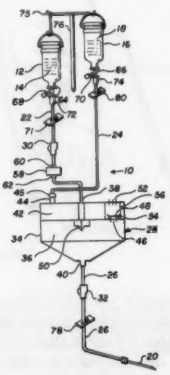
a secondary tube for the flow of a secondary medical liquid therethrough,

a common tube having its distal end in fluid communication with the proximal ends of said primary and secondary tubes and its proximal end open for the flow of liquid therethrough to form a primary liquid flow path comprising said primary tube and said common tube and a secondary liquid flow path comprising said secondary tube and said common tube,

a secondary flow control means in said secondary liquid flow path for adjusting the flow rate of said secondary liquid therethrough,

a primary flow control means on said primary tube for adjusting the flow rate of said primary liquid through said primary flow path to a rate independent of the flow rate of said secondary liquid through said secondary liquid flow path, and

combined air barrier and liquid sequencing means comprising a housing having a first chamber which constitutes a portion of said primary tube and has inlet and oulet ports thereto and a second chamber which constitutes a portion of said secondary tube and has inlet and outlet ports thereto, said housing including;



valve means proximate said outlet port from said second chamber into said first chamber, said valve means being constructed and arranged for permitting the passage of said secondary liquid from said second chamber into said first chamber and for preventing of the passage of air from said second chamber into said first chamber when said secondary liquid is not being dispensed;

check valve means operatively associated with said first chamber for the prevention of primary liquid flow through said primary tube whenever said secondary liquid is being dispensed, and vent means operatively associated

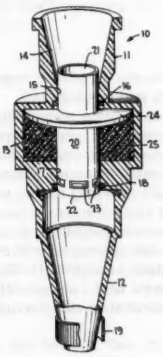
with said second chamber for permitting the passage of air from said combined air barrier and liquid sequencing valve, thereby permitting priming of said system.

4,324,239

SAFETY VALVE FOR PREVENTING AIR EMBOLISM AND HEMORRHAGE

Marvin Gordon, East Windsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corp., Clark, N.J.

Filed Jun. 20, 1980, Ser. No. 161,308
Int. Cl.³ A61M *5/00*; F16L *29/00*
U.S. Cl. 128—214 R **10 Claims**



1. An improvement in safety valves of the type used in catheterization procedures wherein a valve chamber includes a piston which is reciprocable between two positions in said chamber by means of a resilient bias member which urges the piston to a first of said two positions in which the valve is closed and by means of a connection to a fluid conduit which urges said piston to a second of said two positions wherein said valve is open, said improvement comprising:

an internal flow path in said piston including means responsive to said piston being in said second position for freely conducting flow through said piston;

means for blocking flow through said internal flow path when said piston is in said first position;

and wherein said bias member comprises elastomeric flow restrictive means surrounding a portion of said piston in said chamber for at least severely restricting flow through said chamber around said piston.

4,324,240

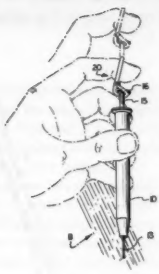
Patent Not Issued For This Number

4,324,241

HYPODERMIC SYRINGE OPERABLE WITH DOUBLE-LOOPED RING

William J. Reese, Brunswick, Ohio, assignor to Alfred D. Lobo, Cleveland, Ohio, a part interest

Filed Sep. 9, 1980, Ser. No. 185,600
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 PA **1 Claim**



1. A hypodermic syringe assembly to be used for withdrawing fluid into its barrel with only one hand, comprising in combination,

a plunger having a stem terminating in a head at one end, the other end being slidably snugly fitted in said barrel,

a double-looped ring member, movable with respect to said plunger and formed from a continuous piece of wire stock to provide

(i) a generally circular index finger loop adapted to have inserted therein the index finger of the hand which holds said barrel, and

(ii) a generally elongate stem loop adapted to slidably accomodate said stem and be lodged against said head,

said index finger loop and said stem loop being manually deformable and generally orthogonal relative to one and another so as to permit withdrawal of said plunger with outward articulation of said index finger exerting a force along an arcuate segment having a radius of at least 5 centimeters.

4,324,242

FEMININE SYRINGE

Marvin G. Cross, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 3, 1980, Ser. No. 193,785
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—232 **9 Claims**

1. A combined valve and dispensing pipe affording a two-step release actuation for an expandable syringe unit comprising:

a hollow nozzle defining a head with a hollow spray stem and an inlet portion;

an expandable bag having a neck portion;

a valve member defining a nozzle actuated portion, a nozzle receiving portion and a filling portion having an orifice carried in said valve member;

means to secure said neck portion of said bag to said valve member;

engagement means defined by said inlet portion of said nozzle and said nozzle receiving portion of said valve member, said engagement means includes a flange on said nozzle receiving portion of said valve and capture means for said flange on said inlet portion of said nozzle, said nozzle is retainable in a spaced relationship with respect to said nozzle actuated portion in a first position and to contact and open said nozzle actuated portion in a second position;

whereby said nozzle member can be detached from said valve member and a filling pipe or faucet head can be inserted over said filling orifice to fill said bag with a liquid and subsequently said inlet portion of said nozzle can be operatively positioned in said nozzle receiving portion and said engagement means will position said inlet portion of said nozzle away from said nozzle actuated portion, in a first position and upon movement of said nozzle inlet portion in the direction of said bag, said nozzle inlet portion will open said nozzle actuated portion and provide fluid communication with the liquid in said bag in a second position.

4,324,243

APPARATUS AND PROCESS FOR ASPIRATING AND EVACUATING A SURGICAL SITE

Maxwell A. Helfgott, 5640 Bradley Blvd., Bethesda, Md. 20014, and Gerald N. Helfgott, 5513 Uppingham St., Chevy Chase, Md. 20015

Filed Nov. 28, 1979, Ser. No. 97,983
Int. Cl.[3] A61M *1/00*
U.S. Cl. 128—276 **10 Claims**

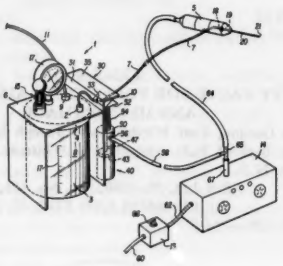
1. A surgical apparatus comprising:

(a) a powered intraocular surgical instrument of the type which is actuated by a series of pneumatic pressure pulses;

(b) a pneumatic control unit for providing a series of pneumatic pressure pulses to actuate said surgical instrument;

(c) a collapsible conduit fluidly connecting said surgical instrument with a source of negative pressure for aspirating said instrument and evacuating material from said instrument;

(d) a pneumatically operated clamping means which is effective when deactuated to cut off the application of negative pressure through said collapsible conduit by clamping a section of said conduit, and to contract the interior volume of said conduit between said clamping means and said instrument to dissipate residual negative pressure existing therebetween, and which is effective when actuated by a pneumatic pressure pulse to unclamp said section of said



conduit and thereby to permit negative pressure to be applied through said conduit; and

(e) a pneumatic connection means fluidly connecting said surgical instrument and said clamping means with the output of said pneumatic control unit for simultaneously providing pneumatic pressure pluses to said surgical instrument and said clamping means, whereby said surgical instrument and said clamping means are simultaneously actuated and simultaneously deactuated, said clamping means thereby functioning to prevent negative pressure from being applied through said collapsible conduit to the surgical instrument in the absence of pneumatic pressure pulses from said control unit for operating the surgical instrument.

4,324,244

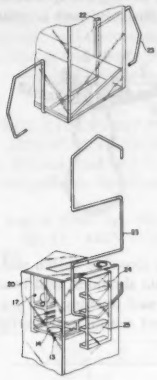
TWO-CHAMBER UNDERWATER DRAINAGE APPARATUS WITH ONEWAY OUTFLOW VALVE AND DUAL HANGAR RETAINERS

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Long Island, both of N.Y., assignors to Robert J. Kurtz, New York, N.Y. and Alfred Kurtz, Wynnewood, Pa.

Filed Feb. 11, 1980, Ser. No. 120,295
Int. Cl.[3] A61M *1/00*
U.S. Cl. 128—276 **6 Claims**

1. A drainage apparatus comprising a housing, a collection chamber formed in said housing for receiving fluids from the body of a patient, an inlet at the upper end of said housing, a partition extending across a portion of the housing to form an underwater seal chamber beneath said inlet, a tubular extension connected to said inlet and projecting downwardly into said underwater seal chamber whereby fluids from the body of a patient are collected in the underwater seal chamber and provide a fluid seal with the lower end of the tubular extension, an outlet to atmosphere disposed in said housing, oneway valve means disposed in said housing between said outlet and the interior of said collection chamber for permitting the outflow of gases from said collection chamber through said outlet and for preventing the reverse flow of such gases, a first hanger retaining means mounted on a side wall of said housing, a second hanger retaining means mounted on an end wall of said housing and hanger means for selectively engaging one of said

hanger retainer means for supporting said drainage apparatus from the floor and for alternatively engaging the other of said



hanger retainer means for supporting the drainage apparatus on the side of the bed.

4,324,245

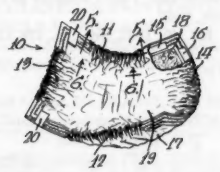
COMFORMABLE DISPOSABLE DIAPERS HAVING ABSORBENT PANEL WITH BULGED SIDE MEMBERS

Frederick K. Mesek, Tinley Park, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 862,309, Dec. 20, 1977, abandoned. This application Dec. 21, 1979, Ser. No. 106,182

Int. Cl.³ A41B *13/02*

U.S. Cl. 128—287 **23 Claims**



1. A disposable diaper comprising: a first outer layer in the form of a moisture impervious backing; an absorbent batt positioned in superposed relationship with respect to said backing, said batt being smaller than said backing and spaced inwardly from the sides and ends thereof; a second outer layer in the form of a moisture pervious facing positioned in superposed relationship with respect to said batt, said facing being larger than said batt and having marginal portions thereof secured to said backing; constringent means in each side margin of the diaper for foreshortening the side margins of the diaper; said constringent means cooperating with said outer layers and said batt to bulge the side margins of the batt, in addition to gathering the side margins of the outer layers adjacent thereto, the central portion of said outer layers and said batt being generally smooth and ungathered.

4,324,246

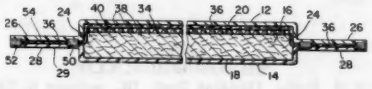
DISPOSABLE ABSORBENT ARTICLE HAVING A STAIN RESISTANT TOPSHEET

William I. Mullane, Wyoming, Ohio, and Douglas J. Smith, Woodbury, Minn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 12, 1980, Ser. No. 148,657

Int. Cl.³ A41B *13/02*

U.S. Cl. 128—287 **8 Claims**



1. A disposable absorbent article comprising:

an absorbent core means for absorbing liquid, said absorbent core means having a first and a second opposed face;

a liquid impermeable backsheet overlaying said first opposed face of said absorbent core means; and

a liquid permeable topsheet overlaying said second opposed face of said absorbent core means, said topsheet being a hydrophobic film having a caliper of less than about 0.030 inches, said topsheet a multiplicity of apertures with less than about 25 percent of said apertures having an equivalent hydraulic diameter less than or equal to about 0.025 inches, said topsheet having a percent open area of at least about 35 percent.

4,324,247

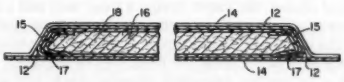
DISPOSABLE ABSORBENT ARTICLE HAVING AN ABSORBENT CORE AND A TOPSHEET

Mohammed I. Aziz, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 12, 1980, Ser. No. 148,900

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **1 Claim**



1. A disposable diaper comprising:

an absorbent core means for absorbing liquids, said absorbent core means having first and second opposed faces;

a liquid impervious backsheet, said backsheet being superimposed on said second opposed face of said absorbent core means;

a liquid permeable topsheet, said topsheet being superimposed on said first opposed face of said absorbent core means and said topsheet being affixed to said backsheet, said absorbent core means being encased between said topsheet and said backsheet, said topsheet being a nonwoven material which is generally hydrophobic and having a multiplicity of depressed areas provided substantially throughout the entire surface of said topsheet, said depressed areas comprising between about 10 percent and about 50 percent of the total surface area of said topsheet, as measured in the plane of said depressed areas, said topsheet having a multiplicity of non-depressed areas surrounding said depressed areas, said non-depressed areas contacting the wearer's skin in use, said depressed areas and said non-depressed areas being of substantially uniform density; and

an intermediate layer interposed between said topsheet and said absorbent core means, said intermediate layer having a multiplicity of tapered capillaries, each of said capillaries having a base in the plane of said topsheet and an apex remote from said plane of said topsheet having an angle of

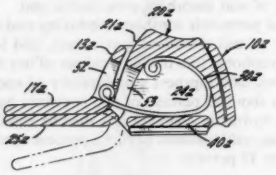
taper of from about 10° to about 60°, having base opening dimensions of from about 0.006 to about 0.250 inches and having apex opening dimensions of from about 0.004 to about 0.100 inches, said apex opening being in intimate contact with said absorbent core means and said base openings being in intimate contact with said depressed areas of said topsheet; said intermediate layer having a crotch portion and first and second end portions; said crotch portion having a multiplicity of said capillaries and said first and second end portions being liquid impermeable.

4,324,248

MICROSURGICAL CLIP

Alfred R. Perlin, Highland Park, Ill., assignor to Metatech Corporation, Northbrook, Ill.

Filed May 30, 1980, Ser. No. 154,613
Int. Cl.³ A61B 17/12
U.S. Cl. 128—325 **12 Claims**



9. A microsurgical clip for clamping of small blood vessels comprising, in combination, a hollow shell in the form of a box having opposed side walls and opposed front and back walls but with openings extending over the top and bottom respectively, the shell having an integral duck bill extending forwardly at the lower edge of the front wall, the shell having an integral duck bill extending forwardly at the lower edge of the front wall with the duck bill being substantially coextensive with the width of the front wall, a cooperating insert of inverted "U" shape conformingly nested in the shell and defining a central pocket, the insert having a front wall and a back wall respectively flatly adjacent the front and back walls of the shell, the insert having its back wall hinged edge-to-edge with the back wall of the shell, the front wall of the insert terminating in a forwardly extending integral duck bill which lies underneath and cooperates coextensively with the duck bill of the shell, and an expansible spring seated in the pocket having one end coupled to the shell and the other end coupled to the insert for urging the insert relatively upwardly into the shell thereby biasing the duck bills into resilient clamping engagement with one another, the insert having a projection which extends through the opening at the top of the shell so that upon application of pinching pressure to the projection the insert is pressed downwardly with respect to the shell compressing the spring accompanied by relative spreading of the duck bills for temporary unclamping of the duck bills and engagement of a blood vessel therebetween.

4,324,249

DEVICE FOR SECURING A TEAT TO A PACIFIER

Per H. Sundkvist, 60 Lövängsvägen, S-183 30 Täby, and Lars Oborg, 35 Bodalsvägen, S-181 36 Lidingö, both of Sweden

Filed May 19, 1980, Ser. No. 151,438
Int. Cl.³ A61J 17/00, 11/00
U.S. Cl. 128—360 **3 Claims**

1. A pacifier comprising: a disc having a central hole therethrough; an annular flange on said disc, said flange being circumferentially spaced from and surrounding said hole, said flange at its outer end having an inwardly directed shoulder and forming with said disc an undercut cavity; a teat having an annular bead defining an open end of the teat, said teat being located in said hole, with said bead residing in said cavity; a generally conical part having a circumferential flange at its larger end, said part being located in said cavity with said circumferential flange having a snap action with said inwardly directed shoulder so that said part is retained in said cavity,

said part being axially movable within said cavity while being retained therein by said shoulder, said bead on said teat lying between the edge of said opening and said generally conical part and being secured within said cavity by said generally conical part.

4,324,250

BODY SLENDERIZING METHOD

Sam M. Braun, and Beatrice Braun, both of 2 rue Recamier, 75007 Paris, France

Filed Dec. 26, 1979, Ser. No. 107,387
Claims priority, application France, Dec. 28, 1978, 78 36737
Int. Cl.³ A61N 7/00
U.S. Cl. 128—395 **14 Claims**

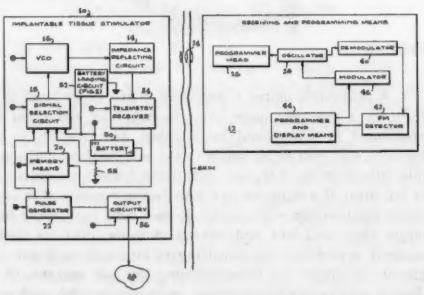
1. Method of body slenderizing, which comprises topically applying on all or part of the body of a patient a composition comprising an unpolymerized silanol in intimate mixture with a substance preventing its polymerization, said silanol being in an amount ranging from about 0.05 and 5 weight percent, covering the treated zone with a fluid-tight flexible sheet, applying heat onto the covered zone during a period of time ranging between 15 minutes and 45 minutes, repeating this sequence of operations at each sitting period, in at least 10 sitting periods at the rate of at least 1 sitting period per month and at most one sitting period per day.

4,324,251

BATTERY MONITORING MEANS AND METHOD FOR AN IMPLANTABLE TISSUE STIMULATOR

Brian M. Mann, Northridge, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jun. 10, 1980, Ser. No. 158,122
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PT **20 Claims**



1. In an implantable tissue stimulator powered by a battery having a positive terminal and a negative terminal, a battery monitoring means comprising:

means for drawing a loading current from said battery that

results in said battery output voltage having a predetermined relationship with respect to a reference voltage; and

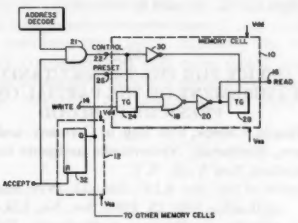
means for generating a battery monitoring signal related to said loading current, said battery monitoring signal being related to the internal impedance of said battery.

4,324,252

MEMORY CONTROL CIRCUITRY FOR IMPLANTABLE MEDICAL DEVICES

Martin A. Rossing, Ramsey, and Ray S. McDonald, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 4, 1980, Ser. No. 175,158
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **4 Claims**



1. Memory control system for use in an implantable medical device of the type having volatile memory cells for the storage of information comprising:

a plurality of volatile memory cells, each having a memory WRITE input, a memory READ input, a CONTROL input and a PRESET input wherein a signal coupled to said PRESET input is used for presetting said memory cells to a known configuration corresponding to a safe operating condition for the device; and

power monitor means for monitoring the power available to said memory cells and for producing a power monitor output signal coupled to said PRESET input when the power available to said memory cells fails to meet specific criteria.

4,324,253

TRANSCUTANEOUS PAIN CONTROL AND/OR MUSCLE STIMULATING APPARATUS

Ronald W. Greene, 3116 S. 133rd St., Seattle, Wash. 98168, and John L. Marshall, 16206-123rd Ave. SE., Renton, Wash. 98055

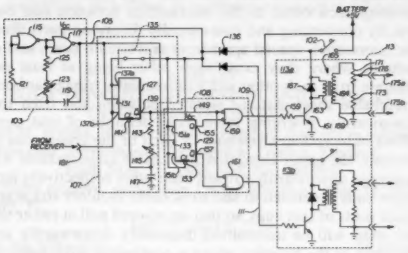
Continuation of Ser. No. 763,542, Jan. 28, 1977, Pat. No. 4,147,171. This application Mar. 29, 1979, Ser. No. 25,111
Int. Cl.³ A61N *1/32*
U.S. Cl. 128—421 **6 Claims**

1. An apparatus for treating pain and for stimulation of muscles in the human body by electrical impulses, comprising:

a. means for generating control pulses of selected rate and duration;

b. transformer means having primary and secondary windings for producing, under the control of said control pulses, by transformer action, electrical impluses at the secondary of said transformer means of desired rate, duration, and amplitude for application to the human body, wherein the operating characteristics of the transformer are such that the transformer operates near, but not in, saturation over the range of effective current output of the apparatus;

c. output load means connected in parallel with the secondary winding of said transformer means, wherein said load means includes means for accepting electrode connectors which connect the apparatus to the user, and wherein said load means has a sufficient resistance to draw a current when the apparatus is not loaded by a user, and wherein the resistance of the load means and the secondary winding is sufficiently high that the current output of the apparatus remains substantially constant over the operating range of the apparatus.

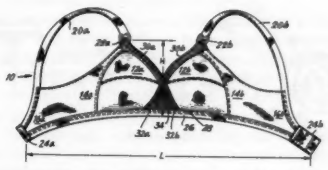


4,324,254

BRASSIERE HAVING A BOTTOM STRETCH BAND

Murray Freedman, Floral Park, N.Y.; Arthur E. Vale, 30 E. 71st St., New York, N.Y. 10021, and Peter R. Vale, New York, N.Y., assignors to Arthur E. Vale, New York, N.Y.

Continuation of Ser. No. 783,530, Apr. 1, 1977, abandoned. This application Aug. 7, 1979, Ser. No. 64,620
Int. Cl.³ A41C *3/00*
U.S. Cl. 128—494 **4 Claims**



1. A brassiere having a pair of cups, opposed side portions connected to and extending laterally from said cups with the latter being situated between said side portions, and a pair of back portions respectively extending from said side portions and terminating in free ends, a pair of stretchable shoulder straps extending from upper parts of said back portions to upper parts of said cups, and a pair of fastener portions fixed to said free ends of said back portions and forming a releasable fastener means for fastening the brassiere on the wearer at the back of the wearer, said cups as well as said side and back portions all having lower regions distributed along the bottom of the brassiere, the improvement comprising an elongated continuous stretch band fixed to and extending continuously along said lower regions of said cups and side and back portions and terminating in free ends respectively fixed to said fastener portions, said stretch band being in a stretched condition when the brassiere is worn with said fastener portions attached to each other, whereby said stretch band serves to anchor the brassiere to the body of the wearer to oppose undesirable displacement of the brassiere due to lateral or vertical movements of the body, or combinations of such movements, said cups respectively having outer side edge regions connected with said opposed side portions, respectively, and inner side edge regions situated adjacent each other, said inner side edge regions of said cups respectively having upper elongated side sections which converge downwardly toward each other and lower elongated edge sections which diverge downwardly away from each other and terminate in lower ends spaced apart from each other and fixed to said stretch band, the upper edge section of one cup forming a continuation of the lower edge section of the other cup, and the upper edge section of the

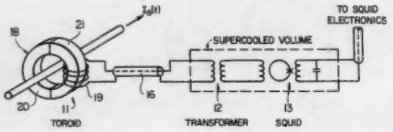
other cup forming a continuation of the lower edge section of said one cup, said edge sections at said inner side edge regions of said cups being stretchable along their entire lengths, and said edge sections at said inner side edge regions of said cups crossing each other at the intersection between said downwardly converging and downwardly diverging parts thereof, the intersection spaced apart from said stretch band, said edge sections where they cross each other being at least partly separate from each other and a substantially trinagular body of stretchable sheet material situated between and fixed to the downwardly diverging lower edge sections of said cups to afford independent stretching of each of the continuous edge sections, the upper elongated stretchable edge sections which converge downwardly toward each other respectively having upper ends connected to said stretchable shoulder straps at said upper parts of said cups, so that an upward pull at either shoulder strap will be transmitted diagonally downwardly across the front of the brassiere along a continuous stretchable edge section to the stretch band toward that side of the body which is opposite from the side where the upwardly pulled shoulder strap is located.

4,324,255

METHOD AND APPARATUS FOR MEASURING MAGNETIC FIELDS AND ELECTRICAL CURRENTS IN BIOLOGICAL AND OTHER SYSTEMS

John P. Barach, 541 Hickory Trail Dr., Nashville, Tenn. 37209, and John P. Wikswo, Jr., 1025 Manly La., Brentwood, Tenn. 37027

Filed Mar. 7, 1980, Ser. No. 128,197
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—630 **2 Claims**



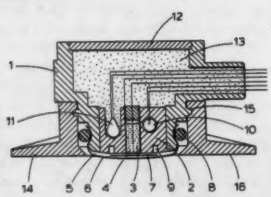
1. The method of measuring the electric currents in an nerve, muscle fiber, biological system or organ which comprises the steps of coupling at room temperature a toroidal core to the magnetic fields induced by said currents, sensing the magnetic fields coupled into said toroidal core and generating an output current, and measuring the output current with a superconducting quantum interference device (SQUID).

4,324,256

ELECTRODE DEVICE

Peter K. R. Vesterager, Maalov, Denmark, assignor to Radiometer A/S, Copenhagen, Denmark

Filed Mar. 15, 1979, Ser. No. 20,870
Claims priority, application Denmark, Mar. 28, 1978, 1361/78
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **7 Claims**



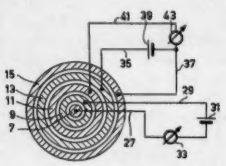
1. A potentiometric electrode device is transcutaneous pCO_2 measurement, said device comprising a capsule suited for application on a skin surface with a CO_2 premeable membrane closing one side of said capsule and serving as a contact face against the skin and a pH-sensitive measuring electrode located within said capsule, said electrode arranged behind the membrane, an electrolyte in contact with the measuring area of the said electrode and positioned between said measuring area and the membrane, a reference electrode communicating with the electrolyte, and a heating device in thermal communication with said measuring electrode for thermostating the measuring electrode and thermally stimulating the blood flow in the skin in the measured area, said heating device being capable of providing a heat level sufficient to produce vasodilation and for compensating for the heat loss to the surroundings, the reference electrode being in direct heat-conductive contact with the heating device, and the reference electrode surrounding the measuring electrode and being in heat-conductive contact with the membrane for thermal stimulation of the local bloodflow, said reference electrode having a predetermined shape capable of producing a thermostating exactitude of greater than 0.2° C. for said heat level.

4,324,257

DEVICE FOR THE TRANSCUTANEOUS MEASUREMENT OF THE PARTIAL OXYGEN PRESSURE IN BLOOD

Scato Albarda, Lübeck, Fed. Rep. of Germany, and Martinus H. Kuijpers, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 8,137, Jan. 31, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,405
Claims priority, application Netherlands, Feb. 20, 1978, 7801867
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **6 Claims**



1. A device for the transcutaneous measurement of partial oxygen pressure in the blood of humans or animals, comprising:

a measuring head;

a measuring cell contained in a space within said measuring head which includes a first measuring electrode, a first reference electrode, and an electrolyte solution surrounding said first electrodes;

oxygen permeable diaphragm means disposed between said first electrodes and the skin which function to contain the solution within said space; and

a essentially annular shielding cell which surrounds the measuring cell and includes an essentially annular second measuring electrode and an essentially annular second reference electrode; said second electrodes being situated in a space within said measuring head which is similar to the space containing the measuring cell.

4,324,258

ULTRASONIC DOPPLER FLOWMETERS

Werner Huebscher, Buenstrasse 10, 8600 Dübendorf, and Max Anliker, Schlösslistr. 22, 8044 Zuerich, both of Switzerland

Filed Jun. 24, 1980, Ser. No. 162,668
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—663 **10 Claims**

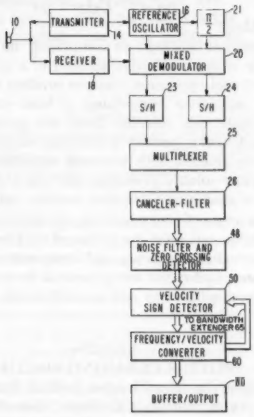
10. An ultrasonic Doppler system for measuring velocity of fluids moving within internal patient structures comprising:

means for transmitting an acoustic beam of addressing pulses of ultrasonic frequency acoustic waves having a regular pulse repetition rate into said patient structure, and receiving the reflected acoustic echo energy from both stationary and moving acoustic scatterers within the path of said beam, and demodulating same into quadrature electrical signals containing both Doppler and stationary echo information;

means for sampling said echo signals into a plurality of equal channels, each corresponding to a portion of the time between said addressing pulses;

means for determining from the digital form of said Doppler echo information, the velocity of said fluids;

filter canceller means receiving signals from said means for sampling, and supplying an output to said velocity determining means, said filter in turn processing each of said channels, said filter employing a recursive loop including a digital memory for comparing the echo signals from each addressing pulse with its intermediate echo signal precedessor, a subtractor to subtract any unchanged non-Doppler components for each channel, and an analog-to-digital converter for rapidly digitizing the remaining changing components of said echo signal, said means including comparator means in parallel with said analog-to-digital converter for identifying the highest active



digital bit between the digital dynamic range of bids in the data path of the incoming echo signals, and the dynamic range of the analog-to-digital converter, said comparator means providing said highest active bit to be added along with the output of said analog-to-digital converter into said memory, so that upon comparison of the output of said memory with the incoming echo signal for each given channel and subtraction therefrom, and subsequent iterations thereof, the number of iterations is decreased;

means included in said velocity determining means for determining from said remaining changing components of said signal in digital form, the zero crossing in one direction to obtain the Doppler frequency for each channel;

means included in said velocity determining means for determining from said Doppler frequency information, and information as to whether the sign of the Doppler shift is positive or negative, the Doppler frequency for each channel, said means including means accumulating digital counts representative of said zero crossing; and

means for determining the sign of said Doppler shift and supplying said information to said means for determining velocity, including

means for comparing the quadrature components of said quadrature signals to determine the instantaneous sign of said Doppler frequency shift for each channel, and means for comparing said accumulating counts against a predetermined frequency, and upon said counts exceeding the value corresponding to said predetermined frequency, substituting the sign which was determined just prior to exceeding said value, in preference to said instantaneous sign.

4,324,259

BODY FUNCTION DETECTION AND MEDICAL INSTRUMENTS THEREFOR

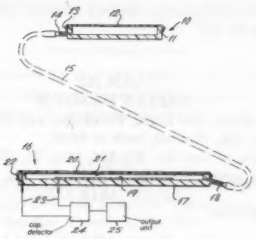
Basil M. Wright, Rickmansworth, England, assignor to National Research Development Corporation, London, England

Filed Mar. 26, 1980, Ser. No. 133,968

Claims priority, application United Kingdom, May 16, 1977, 20492/77

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—722 **6 Claims**



1. An abdominal spherometer comprising:

a detector capsule means adapted for attachment to the abdominal wall and partly defined by a resilient diaphragm for engagement and complementary movement with said wall, said capsule means being in the general form of a hollowed disc with an overall diameter of 20–40 mm;

compartment means enclosing a variable volume;

flexible valveless tube means connecting the interiors of said capsule means and compartment means in continuous mutual communication and defining with said capsule means a closed pneumatic assembly so that the only means of communication between said compartment means and said capsule means is through said flexible valveless tube means;

said compartment means having a movable wall portion;

and a transducer means operably connected with said compartment means to respond to volumetric variations of opposite sense in said capsule means due to abdominal expansion and contraction, said transducer means comprising a capacitor including a fixed electrode and a movable electrode, said movable electrode being a flexible, electrically conductive metallized diaphragm forming said movable wall portion of said compartment means.

4,324,260

VOLUMETRIC SPIROMETER

George Puderbaugh, Manlius, N.Y., assignor to Diemolding Corporation, Canastota, N.Y.

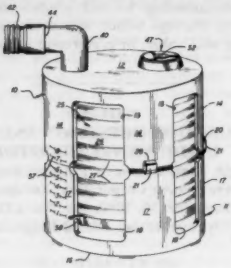
Filed Oct. 9, 1979, Ser. No. 83,165

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—728 **11 Claims**

1. A volumetric spirometer comprising a generally cylindrical two-part housing having top and bottom walls, a bellows member positioned in the housing, the bellows member having a bottom closure and being suspended in extended condition from the housing top wall, and port means in the top wall in communication with the interior of the bellows member whereby removing air from the bellows member interior through the port means causes the bellows member to contract, each of the housing parts having a plurality of spaced apart discrete wall sections, the wall sections of the two parts

interfitting with one another to reduce the size of the spirometer for shipping, the wall sections of the housing parts being



brought into confronting, abutting relation when the spirometer is set up for use.

4,324,261

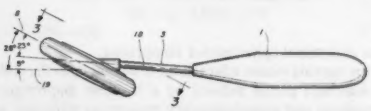
REFLEX HAMMER

Vernon H. Mark, 333 Leest, Brookline, and Thomas D. Sabin, 28 Collins Rd., Newton, both of Mass.

Continuation of Ser. No. 909,354, May 25, 1978, abandoned. This application Apr. 3, 1980, Ser. No. 136,793

Int. Cl.³ A61B *5/10*

U.S. Cl. 128—740 **16 Claims**



1. A hammer for testing neurological reflexes comprising a head, a flexible shaft and an elongated handle wherein a first and a second end of said flexible shaft is connected to said head and elongated handle, respectively, said head having an elongated striking edge extending and fixed at a first acute angle to said flexible shaft and said handle extending and fixed at a second acute angle to said flexible shaft.

4,324,262

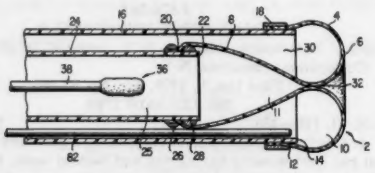
ASPIRATING CULTURE CATHETER AND METHOD OF USE

John E. Hall, Charlottesville, Va., assignor to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Jan. 2, 1979, Ser. No. 551

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—756 **18 Claims**



1. A catheter adapted for isolating a portion of a body cavity in a pristine environment, said catheter comprising:

a flexible outer tube having a distal end, said outer tube being adapted for insertion into said body cavity for a substantial portion of said outer tube, whereby said distal end of said outer tube is adjacent said portion of said cavity to be isolated;

an inner tube having a distal end, said inner tube being axially disposed within said outer tube;

means for selectively locking said inner tube relative to said outer tube in at least one position, wherein the distal end of said inner tube is entirely within said outer tube;

a cylindrical reflected membrane having a reflected portion and two ends, one said end of said reflected membrane being connected adjacent said distal end of said inner tube, the other said end of said reflected membrane being connected adjacent said distal end of said outer tube, said reflected membrane defining a pristine chamber, said membrane being shorter in length than said outer tube;

means associated with said membrane for closing said pristine chamber adjacent said reflected portions; and

means associated with the other ends of said tubes for introducing fluid under pressure into said reflected membrane.

4,324,263

HAIR STRAIGHTENING PROCESS AND HAIR CURLING PROCESS AND COMPOSITIONS THEREFOR

Mario de la Guardia, Savannah, Ga., assignor to Carson Products Company, Savannah, Ga.

Filed Feb. 8, 1980, Ser. No. 119,837

Int. Cl.³ A45D *7/00*

U.S. Cl. 132—7 **4 Claims**

1. A method of treating hair comprising the steps of contacting the hair with an effective amount of a composition comprising the freshly prepared reaction product formed by reacting a first ingredient comprising at least one water-soluble inorganic hydroxide selected from the group consisting of calcium hydroxide, barium hydroxide, strontium hydroxide and mixtures thereof, with a second ingredient comprising at least one water-soluble guanidine salt selected from the group consisting of guanidine phosphate, oxalate, sulfite, fluoride and tartrate, the anion of said guanidine salt forming a substantially water-insoluble salt with the cation of said inorganic hydroxide, and thereafter removing said composition from the hair, said inorganic hydroxide being present in at least a stoichiometric amount relative to said guanidine salt.

4,324,264

BOTTLE CLEANING MACHINE

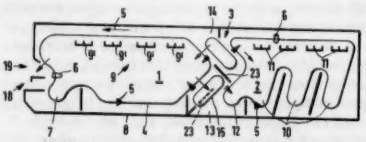
Roland Krüger; Joachim Clongwa, both of Dortmund; Günther Smusch, Werne, and Klaus Ehrlinger, Holzwickede, all of Fed. Rep. of Germany, assignors to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,436

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917065

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—68 **12 Claims**



1. Machine for cleaning bottles containing several treatment sections for cleaning the bottles of residue and for subjecting the bottles to presoaking, main soaking, and clean rinsing, comprising a machine housing having an inlet for introducing bottles to be cleaned and an outlet for discharging cleaned bottles from said machine housing, circulating chains located within said machine housing for conveying the bottles from the inlet to and through the treatment sections and then to the outlet, and means located on said circulating chains for carry-

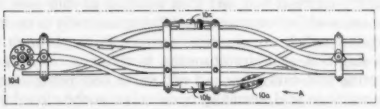
ing individual bottles, wherein the improvement comprises that said machine housing comprises a first housing, a second housing and a transfer section intercommunicating said first and second housings for passing bottles therebetween with said first and second housings being completely separate from one another and spaced apart by said transfer section, said circulating chains comprise a first endless chain located within said first housing, a second endless chain located within said second housing, said first and second chains being arranged to circulate continuously and being separate from one another with a portion of each of said first and second chains moving through said transfer section, said means for carrying individual bottles comprising separate carrier compartments mounted on each of said first and second chains, said first and second chains positioned at said transfer section with said carrier compartments on said first and second chains disposed in spaced relation so that bottles supported in said carrier compartments thereon can be transferred in a free-falling manner passing between said first and second chains, and each of said first and second chains having a lower section and an upper section spaced vertically above said lower section.

4,324,265

CAN END WASHER AND DRYER

Frederick E. Fauth, Towson, Md., assignor to American Bottlers Equipment Company, Inc., Owings Mills, Md.

Filed Feb. 22, 1980, Ser. No. 123,728
Int. Cl.³ B08B *3/04, 5/04;* B05B *1/28*
U.S. Cl. 134—82 **4 Claims**



1. A device for cleaning can ends on a high speed conveyor line comprising a flat, circular member adapted to be mounted on said conveyor line such that said can ends are at least momentarily juxtaposed with said circular member and closely spaced thereto, said circular member having a plurality of high pressure fluid outlet orifices evenly spaced on the side of said circular member facing said can ends and disposed in an annular array on a circle having a diameter approximately equal to the diameter of the can end, a plurality of exhaust ports extending through said member and open to the atmosphere on the other side of said circular member, said exhaust ports being evenly spaced apart and disposed in an annular array on said circle and alternating with said orifices, a high pressure fluid inlet, and a plurality of high pressure fluid conduits connecting said inlet and said orifices, whereby the high pressure fluid striking the can ends atomizes at least some of any liquid on said can ends and exhausts same through said ports.

4,324,266

PROCESS AND DEVICE FOR CONFINING LIQUID METALS BY USE OF AN ELECTROMAGNETIC FIELD

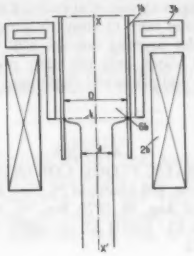
Jacques P. Garnier; Marcel A. Garnier, both of Grenoble, and Rene J. Moreau, Voiron, all of France, assignors to Agence Nationale de Valorisation de le Recherche (ANVAR), Neuilly sur Seine, France

Filed May 29, 1980, Ser. No. 154,425
Claims priority, application France, May 31, 1979, 79 14011
Int. Cl.³ B22D *41/08*
U.S. Cl. 137—13 **10 Claims**

1. A method of contracting a stream of molten metal comprising the steps of:

(a) conveying said stream along a path having an upstream portion and a downstream portion, said stream having a predetermined cross-sectional area in said upstream portion; and

(b) reducing said cross-sectional area in a region between said upstream and downstream portions so that said stream has a lesser cross-sectional area in said downstream portion than in said upstream portion, the reducing step including surrounding said region with an electromagnetic field generated by an alternating current having a frequency less than the inverse of the following product:



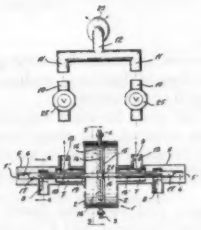
(magnetic permeability of said stream)×(electrical conductivity of said stream)×(square of the radius of said stream in said downstream portion of said path).

4,324,267

FLUID PRESSURE BALANCING AND MIXING VALVE

Huynh Thien Bach, 5775 Ch. Cote des Neiges, app. 203, Montreal, Prov. of Quebec, Canada (H3S 2S9)

Filed Mar. 27, 1981, Ser. No. 248,341
Int. Cl.³ G05D *11/00*
U.S. Cl. 137—100 **4 Claims**



1. A device for balancing the pressure of two different feeds of fluid comprising: a pressure-balancing housing formed of two hollow and inwardly open halves, means to detachably secure said halves together, each of said halves having, rigidly secured thereto, a longitudinal outwardly extending casing portion, both of the latter being aligned, each said casing portion having a smaller diameter bore closed at the outer end of said casing portion and a larger diameter bore located intermediate and communicating with said smaller diameter portion and said housing, all of said bores being in alignment, each said casing portion further having an inlet opening communicating with said smaller diameter bore and an outlet opening communicating with said larger diameter bore, both said inlet and outlet openings being substantially at right angles to said bores, said housing being provided with a centrally located flexible but non-elastic diaphragm dividing said housing into non-communicative left and right sides; the periphery of said diaphragm being secured between said halves, a rigid longitudinally oriented actuating rod extending through the center of said diaphragm and extending into each larger diameter bore substantially axially thereof and terminating short of the smaller diameter bore, a pair of rigid plates secured to said actuating rod, said diaphragm being sandwiched between said plates, a slide valve consisting of a hollow rigid tube open at both ends and

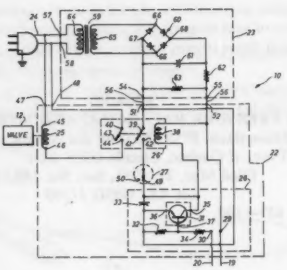
slidably fitted in each said smaller diameter bore and having one end secured to the outer end of said actuating rod respectively, said plates movable between two limit positions in said housing, the marginal portion of said diaphragm extending between said two plates and said housing halves being wide enough to allow free movement of said plates between their two limit positions, each tube having a longitudinal slit in its surface registering with said inlet opening and registering with said larger diameter bore to allow flowing of fluid from said inlet to said outlet opening through said hollow tube, in all positions of said plates, only the static pressure of said fluid being exerted on said plates and diaphragm through said larger diameter bore.

4,324,268

AUTOMATIC FLOOD CONTROL VALVE

Avram A. Jacobson, 100 Sheffield Pl., San Antonio, Tex. 78213

Filed Aug. 24, 1979, Ser. No. 69,264
Int. Cl.³ H01H *35/00*; G08B *21/00*
U.S. Cl. 137—312 **9 Claims**



1. A flood control apparatus for sensing a flood and for discontinuing the flow of fluid to an appliance in response to a flood, comprising in combination:

a fluid probe, said probe having a first probe terminal and a second probe terminal, said probe being adapted to respond to the presence of fluid by permitting the flow of electrical current between said first and second probe terminals;

switching means, said switching means having a sensor terminal, a load terminal, and a common terminal, said sensor terminal being connected to said second probe terminal, said switching means being adapted to generate a flood indication signal between said load terminal and said common terminal in response to a switching signal between said sensor terminal and said common terminal;

power supply connection means, said connection means having a first power supply terminal and a second power supply terminal, said first power supply terminal being connected to said common terminal of said switching means, said second power supply terminal being connected to said first probe terminal, said connection means being adapted to permit the connection of a source of electrical current between said first power supply terminal and said second power supply terminal to facilitate electrical energization of the flood control apparatus;

a solenoid valve coil, in combination with a normally open valve adapted to control the flow of fluid to an appliance, said valve coil having a first end connected to a first input terminal, said valve coil having a second end, and said valve coil being adapted to close said valve in response to the flow of electrical current through said valve coil;

a relay, said relay having a first contact switch and a second contact switch, said first and second contact switches having an open position and a closed position, said relay having a closing coil for switching said first and second contact switches between said open and closed positions, said second contact switch being interposed between the second end of said valve coil and a second input terminal, said second contact switch being normally in the open position when no electrical current flows through said closing coil, said first and second input terminals being adapted to permit the connection of an electrical current source, said second contact switch being adapted to permit the flow of electrical current through said valve coil in response to the flow of electrical current through said closing coil, said closing coil having a first end connected to said second power supply terminal and having a second end connected to said load terminal of said switching means, said closing coil being adapted to close said first and second contact switches in response to the flow of electrical current through said closing coil;

said probe, said switching means, and said first resistor being mutually cooperable to produce a flood indication signal between said load terminal and said common terminal of said switching means in response to the flow of electrical current between said first and second probe terminals;

said switching means, said closing coil, said relay, and said valve coil being mutually cooperable to close said valve in response to said flood indication signal, said valve being operable to shut off the fow of fluid to the appliance; and,

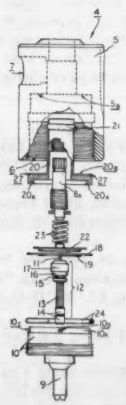
circuit means, said circuit means being adapted to keep said normally open valve closed by maintaining the flow of electrical current through said valve coil after said valve is closed in response to said flood indication signal, said circuit means including said first contact switch, said first contact switch being connected between said first power supply terminal and said load terminal of said switching means, said first contact switch being normally in the open position when no electrical current flows through said closing coil, said circuit means, in cooperation with said closing coil, said relay and said valve coil, being adapted to maintain said normally open valve in the closed position, after said closing coil of said relay is energized by said flood indication signal, even if said flood indication signal disappears.

4,324,269

PRESSURE REGULATOR

Frank Baranowski, Jr., 7 Pine St., Lynnfield Center, Mass. 01940

Filed Jul. 15, 1980, Ser. No. 169,156
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **3 Claims**



1. Apparatus for regulating the valving of fluid, comprising a single-part substantially-cylindrical body having an inlet extending axially into one end thereof and an outlet opening

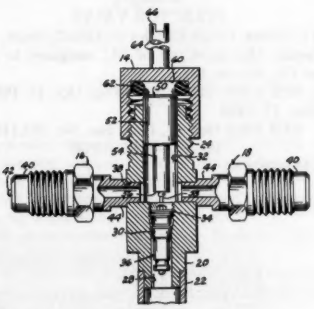
substantially radially through said body at a position axially displaced from the inlet, a cup-shaped insert fitted within said inlet and there sealed peripherally with said body, a spring-activated valve including a seat sealed with said insert at the site of said inlet and a cooperating valve element normally biased toward closure with said seat and having a stem projecting inwardly along the axis of said inlet, a substantially circular and flat diaphragm within said body downstream of said valve and engaging said stem substantially centrally along one side thereof which is exposed to fluid output from said valve, a hollow support fitted coaxially within said body downstream of said insert, said support including a cup-shaped part having its rim sealed fluid-tight with said diaphragm along the periphery thereof on the other side thereof, set spring means within said support for applying force to said other side of said diaphragm axially opposite said stem, said set spring means including a pressure-setting stem extending through said support opposite said diaphragm and further extending outwardly of said body at the downstream end of said body opposite said one end, said hollow support exposing said other side of said diaphragm to atmospheric pressure by way of clearances where said stem extends through said support, said insert being cup-shaped at an inner end and having its rim in engagement with said one side of said diaphragm near the periphery thereof opposite said rim of said hollow support, passageway means formed by spaces between inside surfaces of said body and peripheries of said diaphragm and said support and conducting fluid downstream from said valve around and past the periphery of said diaphragm and part of said support for communication with said outlet, means providing for passage of fluid flow from said valve and to said spaces across the site of said rim of said cup-shaped inner end of said insert, and means sealing the exterior of said support with said body downstream of said passageway means and axially beyond said part of said support to thereby allow said outlet to be in communication with said passageway means while otherwise sealing said passageway means at said downstream end of said body.

4,324,270

REFRIGERANT LINE SERVICE VALVE

John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120

Filed Aug. 7, 1980, Ser. No. 176,217
Int. Cl.³ F16L *41/04*
U.S. Cl. 137—317 **5 Claims**



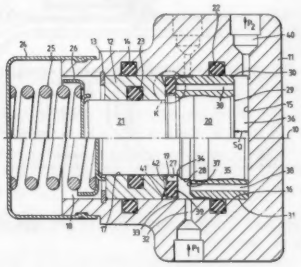
1. A service valve for a refrigerant line, comprising:
a generally cylindrical axially bored body having external threads at one end portion and having its other end portion secured to and communicating with a refrigerant line, said body having a valve seat in its said other end portion and having a counterbore in its said one end portion terminating outwardly of the valve seat and having a lateral bore intersecting the counterbore adjacent the inner limit of the counterbore;
body bore valve means seated on said valve seat and normally closing the body bore;
mandrel means axially movable in the counterbore for opening said valve means;
cap means engaged with said external threads for moving said mandrel toward said body bore valve means; and,
at least one refrigerant outlet means connected with said body for communication with the counterbore through the lateral bore, and said mandrel and said valve means being perpendicular to the axis of said lateral bore and being adjacent to said outlet means at all times during the opening and closing of said valve means.

4,324,271

PRESSURE REDUCING VALVE

Hans-Henning Lüpertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,613
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932142
Int. Cl.³ F16K *17/26*
U.S. Cl. 137—493 **15 Claims**



1. A pressure reducing valve comprising:
a housing having a stepped bore therein disposed coaxial of a longitudinal axis;
a stepped piston disposed in said bore coaxial of said axis, said piston including a larger diameter portion having an end surface defining an outlet chamber and smaller diameter portion defining an inlet chamber;
at least one connecting channel between said inlet chamber and said outlet chamber disposed in said larger diameter portion; and
an elastic rubber sealing body disposed in said bore adjacent an inlet orifice of said channel in said inlet chamber to keep said channel open below a given switching pressure and to close said channel when said stepped piston is moved into abutment with said body upon achievement of said given switching pressure, said body being in abutment with a stop formed in the surface of said bore remote from said orifice, said stop being configured to enable an elastic deformation of at least an outer portion of said body when the pressure in said outlet chamber is greater than the pressure in said inlet chamber to open at least a portion of said orifice.

4,324,272

ANTI-SLOSH BAFFLE COMPARTMENT ASSEMBLY

Edward G. Parks, Encinitas, and August J. Troncale, Jr., San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1980, Ser. No. 197,736
Int. Cl.³ F42B *19/00*
U.S. Cl. 137—574 **5 Claims**

1. An anti-slosh fuel compartment assembly for a vehicle wherein the vehicle has an outer cylindrical shell which forms

a forward gas pressurized fuel compartment and an aft fuel feeding compartment comprising:

an intermediate compartment mounted between the forward pressurized fuel compartment and the aft fuel feeding compartment within said outer cylindrical shell;

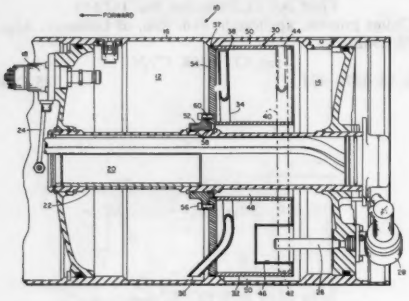
a central tube extending through the forward, intermediate, and aft compartments;

the intermediate compartment being annular about the central tube and spaced therefrom to form an inner annular space therebetween;

the intermediate compartment being spaced from the outer cylindrical shell to form an outer annular space therebetween;

said inner and outer annular spaces being open to and in communication with the aft fuel compartment;

means for sealing the intermediate compartment to the vehicle so that the forward pressurized fuel compartment and



the aft fuel feeding compartment are sealably separated from one another;

an upwardly extending tube mounted in a fore part of the intermediate compartment with a bottom end of the tube opening into a bottom portion of the forward compartment and a top end opening into a top portion of the intermediate compartment; and

another upwardly extending tube mounted in an after part of the intermediate compartment with a bottom end spaced from the bottom of the intermediate compartment and a top end in communication with said aft compartment via said outer annular space so that fuel is communicable from the forward compartment to the aft compartment through the intermediate compartment,

whereby, upon sloshing of fuel in the forward compartment, gas will be trapped in the intermediate compartment to prevent its travel to the aft compartment.

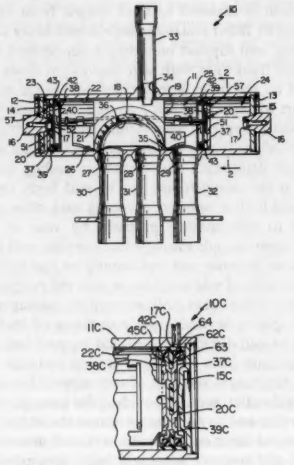
4,324,273

REVERSING VALVE CONSTRUCTION AND PISTON HEAD ASSEMBLY THEREFOR AND METHODS OF MAKING THE SAME

Werner R. Bauer, and Robert A. Van Fossen, both of Richmond, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 958,029, Nov. 6, 1978, Pat. No. 4,245,670.
This application Jan. 10, 1980, Ser. No. 110,940
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—625.43 **4 Claims**

1. In a reversing valve construction having a housing means provided with a movable valve member therein that is interconnected to a piston unit disposed in said housing means and having opposed piston heads that define a main chamber of said housing means therebetween, said housing means having opposed ends respectively cooperating with said piston heads to define a pair of opposed control chambers therebetween, said ends respectively having valve seats leading to said control chambers, each said piston head having a flexible seal member secured between a front disc member and a backing plate of the respective piston head, each said seal member having an integral peripheral skirt that is urged into sliding and sealing engagement with an internal peripheral surface of said housing means by a biasing means of its respective piston head,



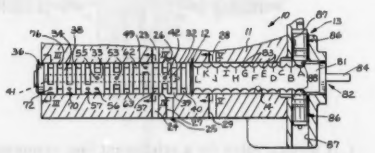
the improvement wherein each biasing means comprises a pair of annular resilient O-ring members carried by the respective piston head and respectively radially engaging and urging said skirt of said respective piston head radially outwardly into said sliding and sealing engagement, each said seal member of the respective piston head being adapted to close said valve seat associated with said respective piston head with moved thereagainst by said piston unit.

4,324,274

SELECTOR VALVE

Kenneth F. Golan, Pekin; Charles N. Goloff, Secor, and James L. Schmitt, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01398, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980
PCT Filed Oct. 17, 1980, Ser. No. 261,110
Int. Cl.³ F15B *13/06*
U.S. Cl. 137—625.68 **7 Claims**



1. A selector valve (**10**) comprising:

a body (**11**) having a bore (**14**), first and second signal ports (**18,17**), a drain port (**23**), and an inlet passage (**25**), said first and second signal ports (**18,17**) and said drain port (**23**) opening into the bore (**14**) and being angularly spaced one from another in a plane transverse to the axis of the bore (**14**), said inlet passage (**25**) being in communication

with the bore (14) and longitudinally spaced from the signal ports (18,17) and the drain port (23); and

a spool (12) having a manifold (41), first and second lands (32,33), an annular groove (37) positioned between said first and second lands (32,33), said first land (32) having a radial passage (42/43), said second land (33) having a first radial passage (48) and a first arcuate pocket (60) in circumferential alignment and a second radial passage (50) and a second arcuate pocket (62) in circumferential alignment and being longitudinally spaced from the first radial passage (48) and first pocket (60), said first and second radial passages (42/43,48,50) being in communication with said manifold (41), said spool (12) being reciprocatably positioned within the bore (14) and movable longitudinally between a first position (A) at which the first and second signal ports (18,17) are in communication with the drain port through the annular groove (37), a second position (B) at which the radial passage (42/43) of the first land (32) is in communication with the inlet passage (25), the first radial passage (48) of the second land (33) is in communication with the first signal port (18), and the second signal port (17) is in communication with the drain port (23) through the first arcuate pocket (60) in the second land (33), and to a third position (C) at which the first radial passage (48) of the second land (33) is in communication with the inlet passage (25), the second radial passage (50) of the second land (33) is in communication with the second signal port (17) and the first signal port (18) is in communication with the drain port (23) through the second arcuate pocket (62) of the second land (33).

4,324,275

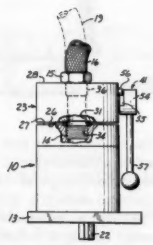
RETROFITTING METHODS AND RETROFITTED HYDRAULIC DRIVES

John D. Ward, 997 E. Athens St., Altadena, Calif. 91001

Filed Jan. 7, 1980, Ser. No. 110,281

Int. Cl.³ F16K *5/04*

U.S. Cl. 137—876 **18 Claims**



13. A hydraulic drive comprising in combination:

an inlet opening adapted for reception of a first fitting for a hydraulic fluid delivery hose;

an adjacent outlet opening adapted for reception of a second fitting for a hydraulic fluid return hose;

means connected between said inlet and outlet openings and driven by said hydraulic fluid;

a block retrofitted on said drive and having a front portion at said adjacent inlet and outlet openings, and a rear portion opposite said front portion;

a first through-opening leading from said rear portion to said front portion for communication with said inlet opening and being adapted for reception of said first fitting at said rear portion;

a second through-opening leading from said rear portion to said front portion for communication with said outlet opening and being adapted for reception of said second fitting at said rear portion; and

valve means in said retrofitted block manually actuable between an open position providing an interconnection between said through-openings for deactivating said driven means and a closed position blocking said interconnection for reactivation of said driven means.

4,324,276

NOISE DAMPING DEVICE

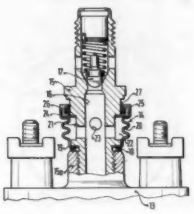
Ulrich Kemner, Sachsenheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,260

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832299

Int. Cl.³ F16L *55/04;* **F16K** *15/00*

U.S. Cl. 138—30 **4 Claims**



3. A noise damping device for smoothing out and reducing pressure vibrations which occur in automobile fuel feed pumps including a fuel pressure line extending from said fuel feed pump to a carburetor of an automobile engine, which comprises: a pressure connection piece connected to said fuel feed pump; a pressure chamber formed by an elastically resiliently yielding wall portion having upper and lower ends surrounding a portion of said pressure connection piece; a fuel inlet connected with said pressure connection piece; said yielding wall portion comprising an annulus having an undulatory surface with the lower end of said yielding wall portion fixed in place on the outside of said pressure connection piece, a mounting ring secured to the upper end of said yielding wall portion and mounted on the outside of said pressure connection piece; said mounting ring being slidable relative to said pressure connection piece and said pressure connection piece including aperatures which permit full flow into said pressure chamber from said fuel inlet.

4,324,277

METHOD FOR PROCESSING ROUND LUMBER INTO CUT LUMBER

Otto Kreibaum, 7 Ortsteil Thuste, 3216 Salzhemmendorf, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,304

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920543

Int. Cl.³ B27C *9/04*

U.S. Cl. 144—312 **4 Claims**

1. A method of producing central heart planks and peripheral slabs from logs cut into cylindrical lumber pieces, each slab of each lumber piece having in a transverse section of the lumber piece, a straight inside edge between the slab and the central heart plank, slab edge profiles inwardly of the circular profile of the round lumber piece at each end of said straight inside edge, and a circular outside surface portion adjacent

each edge profile, the method comprising the steps of conveying each cylindrical lumber piece longitudinally, cutting the edge profiles of at least one slab of the cylindrical lumber piece as it is longitudinally conveyed, guiding each cylindrical lumber piece, as it is being longitudinally conveyed, with the cut edge profiles and, during said guiding step, cutting the slab along its said straight inside edge to separate it from the central heart plank of the cylindrical lumber piece.

4,324,278

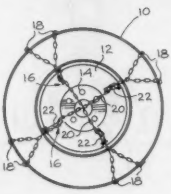
EASY-ON TIRE CHAINS

Carl D. Guenther, 7900 Airlane Ave., Los Angeles, Calif. 90045

Filed May 16, 1980, Ser. No. 150,458

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 R **9 Claims**



1. A tire assembly adapted for use on wheels mounted to hubs on motor vehicles comprising:

a shaped disc adapted to be secured between a wheel and a hub, said disc projecting radially outwardly from its mounting and defining a plurality of anchoring apertures circumferentially spaced about the outward projection thereof; and

a plurality of elongated chain sections, each chain section comprising

(a) a pair of hook elements at opposite ends thereof for attaching to the disc at generally diametrically opposite anchoring apertures thereon,

(b) two pairs of tread chain segments, the segments of a pair being fastened at one end to a corresponding hook element at points spatially separated from each other, the segments being attached at their other ends to corresponding ends of an intermediate chain, and

(c) an intermediate chain joining the pairs of tire chain segments for extending diametrically across the face of a wheel when the chain section is mounted in operative position in order to permit independent mounting of the chain section and establish traction for the wheel independently of other sections of the assembly.

4,324,279

VEHICLE TIRE COMPRISING PNEUMATIC TIRE INSERTS

Richard B. McFarlane, 2400 Myrtle St., Bakersfield, Calif. 93301

Continuation of Ser. No. 3,991, Jan. 16, 1979, Pat. No. 4,275,782, which is a continuation of Ser. No. 776,845, Mar. 24, 1977, abandoned. This application Jan. 26, 1981, Ser. No. 228,110

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ B60C *7/00*

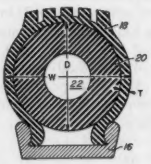
U.S. Cl. 152—314 **40 Claims**

1. In combination:

(a) a wheel rim;

(b) a pneumatic tire casing mounted on said wheel rim; and

(c) a tire insert, said tire insert comprising a resilient annular member having an internal annular bore means dimensioned such that said bore means defines an empty volume from 0.1444 to 0.3136 of the total volume of said member, said insert having a durometer hardness of between 30 to 65 as measured by a type A Shore durometer testor, wherein if L is the total length of the mean circumference of said annular member and C is the total length of the mean circumference of said pneumatic tire casing on said rim, L is larger than C prior to insertion of said insert in said pneumatic tire casing by an amount between 0.005C and 0.013C and wherein if D is the mean diameter of a



cross section of the resilient annular member, W the width and T the wall thickness of the tire casing under normally inflated conditions, then D=W−2T whereby said insert is frictionally retained within said pneumatic tire casing against circumferential sliding movement relative to said tire casing when in use.

4,324,280

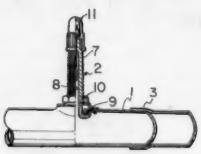
INNER AIR-TUBE OF TIRE FOR BICYCLE

Hirokazu Kubota, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Continuation of Ser. No. 29,713, Apr. 13, 1979, abandoned. This application Dec. 31, 1980, Ser. No. 221,891

Int. Cl.³ B60C *1/00*

U.S. Cl. 152—349 **7 Claims**



1. An inner air-tube of a bicycle tire, said inner air tube substantially composed of a thermoplastic urethane resin capable of undergoing after-crosslinkage at room temperature and of thereby having improved strength, said resin comprising a bifunctional polyol having a molecular weight of about 1500–2500, a diisocyanate having a molecular weight of about 200–250, and a diol having a molecular weight of about 62–180, the ratio by mole of NCO in the diisocyanate to OH in the combination of the bifunctional polyol and the diol being in the range of 1.05–1.10:1; said bifunctional polyol being a polycaprolactone with a molecular weight of about 1500–2500.

4,324,281

METHOD, COMPOSITION AND PRODUCT EMPLOYING A TETRACARBOXYLIC DIANHYDRIDE TO IMPROVE ADHESION BETWEEN A METAL MEMBER AND A CONTIGUOUS RUBBER SKIM STOCK

Frederick J. Ravagnani, Uniontown, and Steven E. Schonfeld, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 11, 1980, Ser. No. 139,302

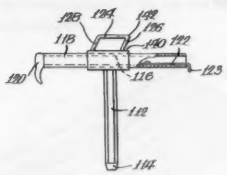
Int. Cl.³ B60C *1/00*; B29H *9/02*; C09J *3/00*; C08K *5/09*

U.S. Cl. 152—359 **9 Claims**

1. In a cured rubber skim stock of conventional composition, wherein said cured rubber skim stock of conventional composition does not include an epoxy resin adhesive said stock being bonded to at least one metal member contained within said

stock, the improvement wherein from 0.5 to 15 phr of a tetracarboxylic dianhydride is incorporated into said stock prior to curing.

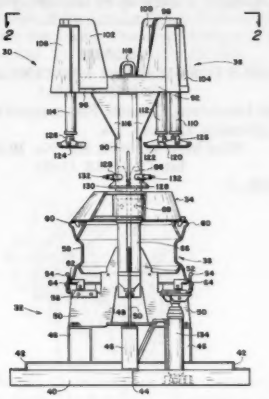
4,324,282
TIRE CHANGING APPARATUS
Charles G. Leeper, Antioch, Tenn., assignor to Hennessy Industries, Inc., Elk Grove Village, Ill.
Filed Mar. 26, 1980, Ser. No. 134,305
Int. Cl.³ B60C *25/08*
U.S. Cl. 157—1.22 **4 Claims**



1. A tire changer comprising:
a base having a lower extremity to support the base on an underlying surface;
a table top having wheel securing means;
means mounting said tabletop on said base for pivotal movement about a generally horizontal axis between tire changing positions and a generally vertical, wheel loading and unloading position whereat said securing means is in sufficiently close proximity to the underlying surface supporting the base so as to be engageable with and securable to an upright wheel and tire on the underlying surface;
means for selectively pivoting said tabletop between said positions;
means for driving a tire changing tool relative to said securing means, and thus a wheel secured thereby to said tabletop;
and;
an elongated drivable tool connectible to said driving means for mounting a tire on a wheel including a tool head and a tire bead support surface remote from said tool head, said tire support surface being defined by a handle on said tool.

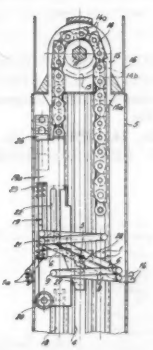
4,324,283
METHOD AND APPARATUS FOR MOUNTING A GIANT TIRE
Floyd E. McCann, and Robert M. Fornell, both of Tulsa, Okla., assignors to Unit Rig & Equipment Co.
Filed May 6, 1980, Ser. No. 147,196
Int. Cl.³ B60C *25/06*
U.S. Cl. 157—1.28 **5 Claims**

1. An improved tire changing apparatus comprising a stand having an upwardly extending ram, means for locking the lower flange of a single-piece dual-flanged rim onto said stand, an oblique mounting cone having the majority of its side surfaces cut away except for three sloped side segments wherein one sloped side segment is of a steeper inclination with respect to the horizontal than the two remaining side segments, said two remaining side segments of lesser inclination being spaced from said one steeply sloped side segment in opposite circumferential directions somewhat less than one third of the circumference of said cone, said cone being positioned atop said rim and having said ram extending through its center, a presshead having a downwardly extending central post and three cylinder arms, said presshead being positioned above said cone and having said ram received within said post, means for locking said ram and said post together, said cylinder arms having upper ends pivotally mounted on the outer ends of a portion of said presshead and extending downwardly therefrom, a horizontally disposed foot being pivotally mounted at its center on the lower end of each cylinder arms wherein each foot is aligned with a respective sloped side segment and being



adapted to rest on the upper sidewall of a pneumatic tire to be mounted on said rim.

4,324,284
VENETIAN BLIND
Paul Frei, Elgg, Switzerland, assignor to Griesser A. G., Switzerland
Filed Feb. 7, 1980, Ser. No. 119,501
Int. Cl.³ E06B *9/30*
U.S. Cl. 160—172 **9 Claims**



1. A venetian blind, comprising: a plurality of slats; a pin extending from at least one side of each of said slats; a casing having a longitudinally extending slot for receiving said pins to permit longitudinal movement of said slats; collapsible support means interconnecting said plurality of slats for pivoting said slats as said slats are moved to extend and retract said blind, and for defining a full extension of said slats; a driven windup shaft rotatably mounted with respect to said casing; a draw member engaged with said windup shaft and movable in said casing by rotation of said shaft to retract and extend said slats; an upper carriage part connected to one end of said draw member having a stop surface; an end stop on said casing against which said stop surface is abutable to stop movement of said draw member in one direction; a lower carriage part slidably connected to said upper carriage part and connected to a lowermost one of said slat pins; and spring means con-

nected between said upper and lower carriage parts to bias said upper and lower carriage parts apart, whereby, additional motion of said draw member beyond the point where said slats are fully extended is taken up by said spring means.

4,324,285

APPARATUS FOR HEATING AND COOLING DEVICES UNDER TEST

G. Douglas Henderson, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Mar. 12, 1979, Ser. No. 19,684
Int. Cl.³ F25B *13/00*
U.S. Cl. 165—2 **17 Claims**

13. The method of performing low temperature electrical tests on microelectronic circuits comprising the steps of:

placing a heat sink in heat transfer contact with the device under test, the heat sink having a heater, and a reservoir containing dry ice;

controlling the heater to achieve a selected equilibrium temperature between the temperature of the dry ice and the ambient temperature;

performing low temperature electrical tests; and

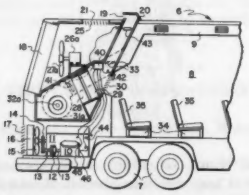
removing the heat sink from the device under tests.

4,324,286

CONTROL FOR VEHICLE TEMPERATURE CONDITIONING SYSTEM

William C. Brett, Wetumpka, Ala., assignor to The Trane Company, La Crosse, Wis.

Filed Mar. 24, 1980, Ser. No. 132,724
Int. Cl.³ F25B *13/00*; B60H *3/04*
U.S. Cl. 165—2 **16 Claims**



10. A method for controlling a temperature conditioning system including a vapor compression air conditioner and a heater for use in a vehicle, said method comprising the steps of

(a) sensing the temperature of air discharged from the system into the interior of the vehicle, at a point downstream of the heater;

(b) sensing the temperature conditioning demand in the interior of the vehicle; and

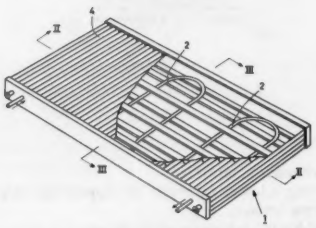
(c) activating the heater in a reheat mode to heat air cooled by the air conditioner, said reheat mode being activated in response to the temperature conditioning demand; and further, de-activating the heater to terminate the reheat mode if the discharge air temperature increases above a setpoint value, whereby the temperature conditioning demand in the interior of the vehicle is satisfied without excessive reheat overshoot resulting from the thermal inertia of the heater.

4,324,287

THERMAL STORAGE DEVICE

Johann Schröder, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,044
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1978, 2846988
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—10 **3 Claims**



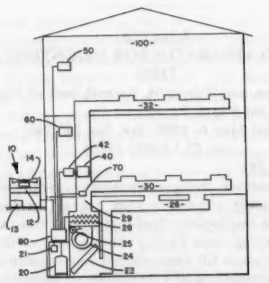
1. A thermal storage device comprising a container filled with a heat storage medium comprising (1) water or a first eutectic mixture of water and a salt hydrate and (2) 1 to 6% by volume of a second eutectic mixture of water and a salt hydrate, the freezing point of component (2) being below the freezing point of component (1).

4,324,288

LEVEL SUPPLY AIR TEMPERATURE MULTI-ZONE HEAT PUMP SYSTEM AND METHOD

Phil J. Karns, Baldwinsville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,588
Int. Cl.³ F24F *3/00*
U.S. Cl. 165—22 **11 Claims**



1. Apparatus for supplying conditioned air to an enclosure which comprises:

a refrigeration circuit having an indoor heat exchanger for transferring heat energy between refrigerant and the air to be conditioned;

circulating means for directing air through the indoor heat exchanger;

means for regulating the volume of air circulated through the indoor heat exchanger by the circulating means;

a return plenum for supplying air to the circulating means;

a supply plenum for receiving conditioned air from the indoor heat exchanger;

a primary zone plenum connected to receive conditioned air from the supply plenum;

a secondary zone plenum connected to receive conditioned air from the supply plenum;

means for regulating the volume flow from the supply plenum to the secondary zone plenum;

means for ascertaining the temperature of the air discharged from the indoor coil; and

control means for adjusting the means for regulating the volume of air circulated through the indoor heat exchanger and for regulating the volume of air flow from the supply plenum to the secondary zone plenum both in response to the temperature of the air discharged from the indoor heat exchanger.

4,324,289

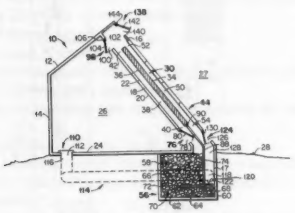
ENVIRONMENTAL HEATING AND COOLING APPARATUS

Raymond L. Lahti, 7520 Pinen Dr., Knoxville, Tenn. 37902

Continuation-in-part of Ser. No. 923,907, Jul. 12, 1978, abandoned. This application May 1, 1980, Ser. No. 145,713

Int. Cl.[3] **F25B** *29/00*

U.S. Cl. 165—48 S **8 Claims**



1. An apparatus for controlling building environment by use of circulating air and the ambient environment comprising:

a solar collector with a front side and back side;

a preheating channel for preheating the circulating air which is in heating contact with one of said sides of said solar collector;

a primary heating channel for heating circulating air which is in heating contact with the other of said sides of said collector;

a collection chamber for collecting circulating air from a selection of one of the building environment and the preheating channel and distributing the air to the primary heating channel and selectively to the ambient environment;

a means for selectively introducing air from said collection chamber into the ambient environment;

a means for storing the heat or cold from the circulating air;

a means for introducing the circulating air to said storing means from one of a selection of ambient environment air and air from the primary heating channel;

a means for introducing the circulating air from the storage means to one of a selection of the building environment and said preheating channel;

a means for selectively exhausting the circulating air from the building environment to said collection chamber;

a means for selectively exhausting the circulating air from the building environment to said storage means; and

a means for circulating the air.

4,324,290

HEAT EXCHANGER COMPRISING A CORE OF TUBES ENGAGED INSIDE END PLATES MECHANICALLY CONNECTED WITH HEADER BOXES

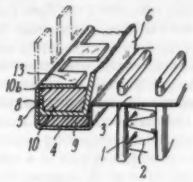
Jean-Pierre Moranne, Saint-Leu-La-Foret, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Oct. 27, 1980, Ser. No. 200,986

Claims priority, application France, Nov. 12, 1979, 79 27789

Int. Cl.[3] **F28F** *9/02*

U.S. Cl. 165—173 **12 Claims**



1. A heat exchanger of the type including a core of tubes (**1**) engaged in tube plates (**3**) that have a peripheral groove (**4**) bounded outwardly by a raised edge (**5**), with a sealing gasket (**9**) on the bottom of the groove in order to be clamped by under side of an edge of a header box (**6**) maintained by gripping means (**13**), characterized in that the header box is thin walled and in that the edge of said header box has a top portion with a small bar (**10**) interposed between said top portion and said gripping means.

4,324,291

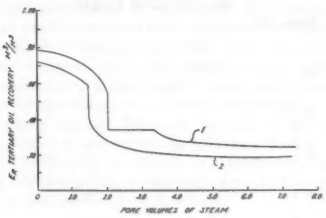
VISCOUS OIL RECOVERY METHOD

Kenny Wong, Houston, and Wilbur L. Hall, Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,732

Int. Cl.[3] **E21B** *43/24, 47/06*

U.S. Cl. 166—252 **20 Claims**



1. A method for recovering viscous petroleum from a subterranean, viscous petroleum-containing, permeable formation including a tar sand deposit, said formation being penetrated by at least one injection well and by at least one production well, comprising:

(a) injecting into the formation via the injection well, a thermal recovery fluid comprising steam at an injection pressure less than the fracture pressure of the overburden above the viscous petroleum formations, and at a determinable flow rate, while restricting the flow rate of fluids from the production well to a value less than the rate at which fluids are being injected into the injection well, in order to increase the pressure in the formation;

(b) determining the formation pressure in the vicinity of the production well;

(c) continuing injecting said thermal recovery fluid into the injection well and producing fluids from the production well at a restricted value until the formation pressure

adjacent the production well rises to a predetermined value;

(d) thereafter increasing the rate of fluid production from the formation via the producing well to the maximum safe value and simultaneously reducing the injection rate of thermal recovery fluid into the injection well to a value which is less than 50 percent of the original rate at which thermal recovery fluid was injected into the injection well, until the flow rate of fluids from the production well drops to a value below 50 percent of the initial fluid production flow rate;

(e) injecting a noncondensable gas into the formation via the injection well at a pressure less than the overburden fracture pressure while restricting the flow rate of fluids from the production well to a value less than the rate at which gas is being injected into the formation until the pressure in the formation adjacent the production well is from 50 to 90 percent of the predetermined pressure of step (c);

(f) thereafter discontinuing injecting noncondensable gas and injecting a thermal recovery fluid comprising steam into the formation while restricting production from the formation via the production well to a value less than the steam injection rate in order to increase the pressure in the formation adjacent to the production well to a predetermined value;

(g) thereafter increasing the rate of fluid production from the formation via the production well to the maximum safe value and simultaneously reducing the rate of injecting thermal recovery fluid to a value less than 50 percent of the original injection rate at which the thermal recovery fluid was injected and less than the production rate until the flow rate of fluids from the production wells drops to a value below 50 percent of the initial fluid production flow rate of this step.

4,324,292

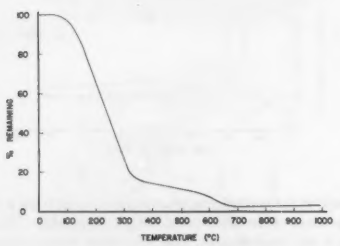
PROCESS FOR RECOVERING PRODUCTS FROM OIL SHALE

Harold R. Jacobs, and Kent S. Udell, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 13,106, Feb. 21, 1979, abandoned. This application Jul. 18, 1980, Ser. No. 170,202

Int. Cl.³ E21B *43/243*

U.S. Cl. 166—261 **18 Claims**



1. A process for recovering hydrocarbonaceous products from a body of fragmented oil shale in situ, comprising:

volatilizing hydrocarbonaceous products from the body of fragmented oil shale by forming in situ a combustion front in the oil shale adjacent the lower end of the body of fragmented oil shale, the thermal energy from said combustion front producing a body of hot shale, a first lower molecular weight fraction and a higher molecular weight fraction;

refluxing the higher molecular weight fraction by condensing said higher molecular weight fraction on oil shale above said combustion front forming a condensate and flowing said condensate downwardly into contact with said body of hot shale;

producing a carbonaceous residue on said body of hot shale by cracking said condensate on said body of hot shale while producing a second lower molecular weight fraction and said carbonaceous residue, the second lower molecular weight fraction volatilizing and passing upwardly through said body of fragmented oil shale;

burning said carbonaceous residue, thereby continuously forming said combustion front and advancing said combustion front upwardly through said body of fragmented oil shale; and

sweeping said first and second lower molecular weight fractions from said body of fragmented oil shale by passing a noncombustible gas upwardly through said body of fragmented oil shale so as to sweep away said first and second lower molecular weight fractions while allowing condensation and downward flow of said higher molecular weight fraction in said refluxing step.

4,324,293

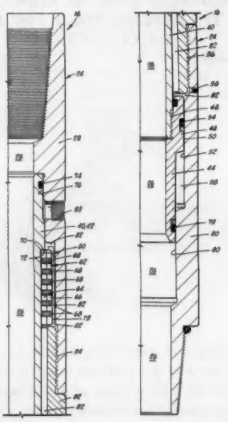
CIRCULATION VALVE

Donald F. Hushbeck, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.

Filed Apr. 29, 1980, Ser. No. 145,319

Int. Cl.³ E21B *34/10, 43/12;* F16K *17/40*

U.S. Cl. 166—317 **5 Claims**



1. A circulation valve, comprising:

a cylindrical housing having an open longitudinal passageway therethrough, a circulation port disposed through a wall of said housing, and a power port means disposed through said wall of said housing;

a valve mandrel slidably received in said housing and movable from a closed position closing said circulation port to an open position opening said circulation port, said valve mandrel including an annular piston means received in said housing for moving said valve mandrel from its closed position to its open position, said power port means being a means for communicating said piston with a pressure exterior of said housing;

frangible restraining means between said valve mandrel and said cylindrical housing for restraining movement of said valve mandrel from its closed position to its open position until said pressure exterior of said housing exceeds a predetermined value, and for frangibly releasing said valve mandrel when said pressure exterior of said housing exceeds said predetermined value, said frangible restraining means including a carrying structure arranged for force transmitting engagement with a surface of said valve mandrel; and

wherein said power port is located above said piston means,

said carrying structure is located above said power port, and said circulation port is located above said carrying structure.

4,324,294

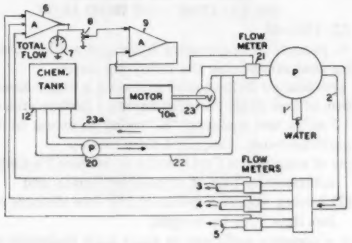
CHEMICAL INJECTION CONTROL SYSTEM FOR FIRE FIGHTING

John McLoughlin, 92 Mobrey La., Smithtown, N.Y. 11787; Neocles Athanasiades, Setauket, and Yehuda Rotblum, Lake Grove, both of N.Y., assignors to John McLoughlin, Smithtown, N.Y.

Continuation-in-part of Ser. No. 10,180, Feb. 7, 1979, Pat. No. 4,246,969. This application Apr. 21, 1980, Ser. No. 141,777

Int. Cl.³ A62C *35/16*

U.S. Cl. 169—13 **1 Claim**



1. Means to inject chemicals into a fire fighting system of the type having a plurality of water hoses,

a source of water supply,

and a source of chemicals;

means to automatically meter a certain ratio of chemicals into the water supply comprising:

a first line connecting the chemical source to the water supply,

means to measure the total flow,

a manual chemical pump connected to the chemical source in the first line and connected to pump chemicals into the water supply,

a second line connected in parallel with the first line,

a valve connected completely within the second line,

and servo motor means responsive to the total flow to control the valve to pump any excess of chemicals back to the chemical source, means in the first line upstream of the source of water supply to allow a portion of the chemicals to be dispensed while the valve is opened and the excess chemicals are being returned to the chemical source.

4,324,295

AGRICULTURAL IMPLEMENT ATTACHABLE TO A TRACTOR

Ernst Weichel, Bahnhofstr. 1, D 7326 Heiningen, Fed. Rep. of Germany

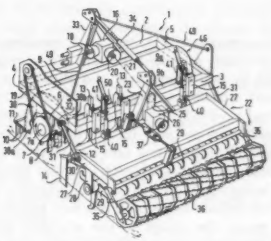
Filed Dec. 8, 1978, Ser. No. 967,873

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755676

Int. Cl.³ A01B *49/04*

U.S. Cl. 172—28 **13 Claims**

1. Agricultural implement arranged to be attached to a tractor for movement in the forward direction over a field and used for loosening tillable soil covered with organic material such as live or dead plants or harvesting residue, said implement comprises a main support frame having a front end support and a rear end support spaced from the front end support in the direction opposite to the forward direction of movement of said implement, and a pair of laterally spaced side supports extending between said front and rear end supports, an axially extending flail-blade cylinder dependently supported on and extending across said frame between said side supports, said flail-blade cylinder including a plurality of flail-blades arranged around the circumference of said cylinder and along the axial direction thereof, means for driving said cylinder, means for covering at least the upper portion of said cylinder, means for loosening soil mounted on and extending downwardly from said main support frame rearwardly of said cylinder, support means located rearwardly of said means for loosening the soil, means for breaking up clods of loosened soil mounted on said support means rearwardly of said means for loosening soil, said flail-blade cylinder arranged to pick up organic material covering the ground, to comminute the material and to throw it in the rearward direction onto the loosened soil over which the implement passes, wherein the improvement comprises that said means for covering said cylinder comprises a covering hood extending around the upper portion of said cylinder between said side supports from the front side of the cylinder toward the rear side thereof with the rear end of said hood arranged for selectively directing in the rearward direction the material acted on by the cylinder, a headstock for



the power lift of the tractor is secured to and extends upwardly from said front end support, distributor gear means mounted on said front end support for driving at least said flail-blade cylinder and including a lateral power take-off shaft and a rear power take-off shaft, a belt drive mounted on said power take-off shaft and said cylinder for driving said cylinder, and said means for breaking up clods of loosened soil is connected to said rear take-off shaft and is driven thereby, said support means located rearwardly of said means for loosening soil comprises an auxiliary support frame supporting said means for breaking up clods of loosened soil, links connecting said auxiliary support frame to said main support frame, adjustable spindles mounted on said main support frame and connected to said auxiliary support frame for pivotally adjusting the position of said auxiliary support frame in the vertical direction, a headstock secured to and extending upwardly from said auxiliary support frame, and an adjustable connecting strut interconnecting said headstock on said main support frame to said headstock on said auxiliary support frame.

4,324,296

MULTI-SECTION AGRICULTURAL IMPLEMENT INCLUDING LATCH ASSEMBLY THEREFOR

Dale C. Schenk, Hamilton, and Anton H. G. Van Hooydonk, St. Catharines, both of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 26, 1981, Ser. No. 228,046

Int. Cl.³ A01B *73/00*

U.S. Cl. 172—311 **5 Claims**

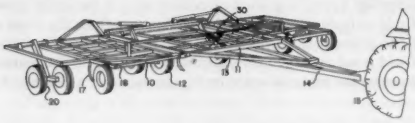
1. A towable multisection agricultural implement and a folding mechanism thereof comprising:

(a) a horizontally disposed and transversely extending to the direction of travel main section having ground wheels and depending ground working tools;

(b) a wing section having ground wheels and depending ground working tools movably connected to each end of said main section and movable between an aligned ground working position and a generally vertical, folded transport position;

(c) a double acting hydraulic cylinder pivotally connected to the main section and to each said wing section to move each said wing section between the ground working and transport position;

(d) latch and support means for maintaining and supporting the wing sections in the transport position, said means comprising: a support mounted on said main section and a telescoping tube having one end pivotally mounted on each said wing section and the other end pivotally mounted on said support, a latch assembly mounted on each said other end of said tube adjacent the support and engageable with said one end of the tube to support same and having a spring biased latch member to latch same in



the transport position, said latch member having a crank arm pivotally mounted thereon and a lever pivotally connected to said crank arm and slidably mounted on said support, a double acting hydraulic latch cylinder having a rod end pivotally connected to said crank arm and lever and said latch cylinder further having a base end pivotally connected to the crank arm and lever of the other opposing latch member, said latch cylinder and said wing cylinders being connected in parallel whereby said latch members are released by said crank arm before the wing cylinders move the wings to the working position and said latch members are reset before said wing cylinders move the wings to the folded and latched position.

4,324,297

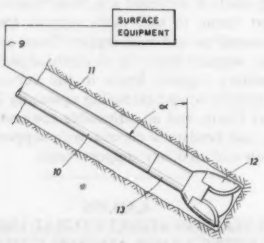
STEERING DRILL STRING

Early B. Denison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 3, 1980, Ser. No. 165,876

Int. Cl.³ E21B *7/04*

U.S. Cl. 175—45 **9 Claims**



1. A method for steering a rotary drilling apparatus while drilling comprising:

measuring the strain on a cylindrical portion of the drilling apparatus at a known position from and in close proximity to the drill bit, said strain being measured in at least four positions 90° apart along the longitudinal axis of the drilling apparatus;

measuring the inclination and orientation of the drilling apparatus to determine the heading of the borehole and the orientation of the strains;

measuring the weight on the drill bit;

transmitting values related to said measurements to the surface;

at the surface computing the resultant force on the bit including its direction and magnitude;

developing a model of the drilling apparatus and comparing the force on the bit and heading of said borehole with said model to determine the required weight on the bit and rotary speed to achieve the desired heading of said borehole; and

controlling the weight on the bit and rotary speed to obtain the required values to steer the drill string.

4,324,298

METHOD OF USING A REACTIVE IRON OXIDE DRILLING MUD ADDITIVE

Irwin Fox, Ballwin, Mo., assignor to Ironite Products Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 44,026, May 31, 1979, Pat. No. 4,246,244. This application Sep. 8, 1980, Ser. No. 185,155

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.³ C09K *7/04;* B01D *53/34*

U.S. Cl. 175—64 **2 Claims**

1. A process of scavenging hydrogen sulfide contained in drilling mud comprising the following steps:

A. providing a drilling mud including a water-based suspension of iron oxide particles having a surface area of at least 3.5 m^2/g and a kinetic "K" value in excess of 3000, said particles being comprised substantially

(1) of amorphous Fe_2O_3 and a crystalline Fe_2O_3 phase and substantially free of crystalline Fe_3O_4, and

(2) having impurity levels of any free element in bulk of less than 10% by weight,

in a quantity sufficient to react such hydrogen sulfide as may be encountered,

B. circulating the drilling mud down the interior of the drill pipe, through the drill bit and up the space between the drill pipe and the formation wall to the surface,

C. entraining in the circulating mud such hydrogen sulfide as may be encountered, and

D. reacting the entrained hydrogen sulfide with the said iron oxide particles under the pressure there present to form substantially acid-stable products of reaction.

4,324,299

DOWNHOLE DRILLING MOTOR WITH PRESSURE BALANCED BEARING SEALS

Dave D. Nagel, Houston, Tex., assignor to Maurer Engineering, Inc., Houston, Tex.

Filed Jul. 18, 1980, Ser. No. 170,565

Int. Cl.³ E21B *4/02;* F03B *13/02*

U.S. Cl. 175—107 **15 Claims**

1. A downhole well drilling tool adapted for connection at one end to the lower end of a drill string and at the other end to a drill bit to be driven thereby, comprising:

tubular housing means,

rotary tubular shaft means supported in said housing means and extending therefrom for supporting a drill bit,

motor means in said housing means for actuation by flow of drilling fluid therethrough and operable to rotate said shaft means,

said shaft means being operable to conduct drilling fluid from said motor means to discharge through said drill bit,

bearing means in said housing means supporting said rotary shaft means,

a first rotary seal positioned between said shaft means and said housing means below said bearing means,

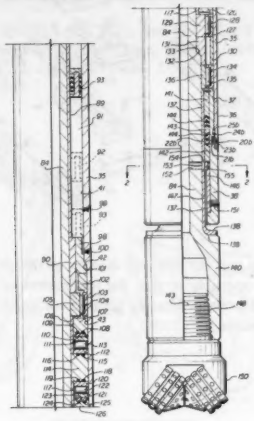
a second rotary seal positioned between said shaft means and said housing means above said bearing means and positioned in fluid communication with drilling fluid flowing from said motor means,

lubricant fluid filling the space around said bearing means between said seals,

a passageway opening from the interior of said rotary tubular shaft means through the wall thereof to a point adjacent to the lower end of said first rotary seal,

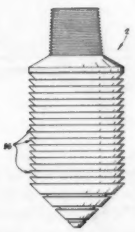
journal bearing means surrounding said shaft means below

said shaft means passageway and including a longitudinally extending passageway in a bearing surface opening from the end of said shaft means passageway adjacent to said first rotary seal to the lower end of said housing means and opening to discharge drilling fluid to the bottom hole annulus at bottom hole pressure, and



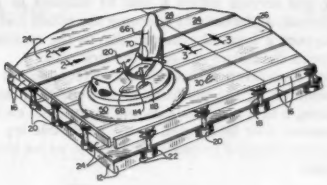
the fluid pressure of drilling fluid applied to said first rotary seal through said shaft means passageway being substantially equal to the drilling fluid pressure applied to said second rotary seal.

4,324,300
ROTARY DRILL BIT
Clifford K. Logan, Jr., P.O. Box 3446, Hickory, N.C. 28601
Filed Jun. 30, 1980, Ser. No. 164,337
Int. Cl.³ E21B *10/26, 10/62, 10/04*
U.S. Cl. 175—379 **7 Claims**



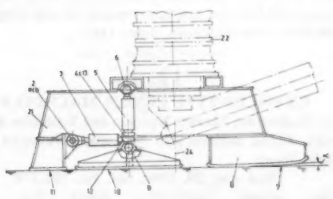
1. A rotary drill bit, comprising:
a support member having a coupling end for attachment to a drill bit drive means; and
a cylindrical cutting member, including:
an inner surface;
an outer surface;
a first end connected to the end of said support member opposite the coupling end thereof;
a second end having a first beveled edge obliquely extending between said inner and outer surfaces; and
a plurality of substantially annular rotary cutting segments having beveled second edges and being disposed axially along said cutting member, each of said annular segments extending circumferentially around said cutting member for providing a plurality of rotary cutting surfaces.

4,324,301
BUMPER CAR AMUSEMENT RIDE
Jon V. Eyerly, 3544 - 12th St. SE., Salem, Oreg. 97302
Filed Feb. 29, 1980, Ser. No. 120,661
Int. Cl.³ B60L *9/00;* **B60M** *1/00*
U.S. Cl. 180—2 R **13 Claims**



1. A bumper car amusement ride, comprising:
(a) a floor,
(b) a plurality of electrically conductive, laterally spaced, elongated metal plates overlying the floor, the plates having a multiplicity of openings therethrough,
(c) an electrically non-conductive strip filling the space between each pair of adjacent laterally spaced conductive plates,
(d) an electrically non-conductive adhesive layer coating substantially the entire underside of the plates and strips bonding the latter to the floor, the adhesive extending upward into the openings in the plates,
(e) means for connecting adjacent plates across a source of alternating current,
(f) a bumper car including a frame, a pair of laterally spaced drive wheels mounted on the frame for axial rotation about substantially horizontal axes, and a pair of longitudinally spaced caster wheels mounted on the frame for axial rotation about substantially horizontal axes and for rotation about substantially vertical axes, the drive and caster wheels supporting the frame for movement over the conductive plates and non-conductive strips, and
(g) electrically activated drive means on the frame coupled to the drive wheels and electrically connected slidably to the conductive plates for its source of electric power.

4,324,302
WALKING MACHINES
Yosef K. Rabinovitch, Johannesburg, South Africa, assignor to Edward L. Bateman Limited, Boksburg North, South Africa
Filed Mar. 12, 1980, Ser. No. 129,694
Claims priority, application South Africa, Mar. 13, 1979, 79/1179
Int. Cl.³ B62D *57/02*
U.S. Cl. 180—8 C **8 Claims**



1. A method of moving a loaded platform consisting in the steps of:
tilting the platform by jacking the platform along a single jacking axis eccentrically to the centre of gravity of the load and in a direction inclined to the vertical in the direction of such centre of gravity;
exerting forces between the jacking axis and the platform to

cause the jacking direction to become vertical and the platform to drag at one end, levelling the platform in its new position, and in that new position repeating the preceding steps and repeating the steps as often as is required until the platform reaches a desired position.

3. A walking machine comprising:

first and second pillars **8** and **11** adapted to rest on the ground, a platform **21** spanning the pillars and adapted to support a load **22** eccentrically to the middle plane between the pillars and over the first pillar **8**,

a single powered extensible and retractable leg **5** pivotally mounted to the platform at the middle plane to move along a first path towards and away from each pillar,

a massive foot **10** pivoted to the extensible leg **5**, and first power means **3** to cause the leg **5** to move along the first path.

4,324,303

EQUALIZER BAR SUPPORT ASSEMBLY

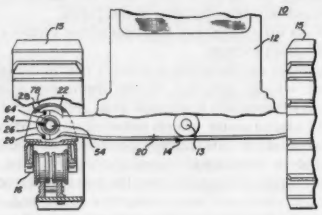
David J. Balzer, East Peoria, Ill., and Orville E. Kessinger, Blue Grass, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00124, § 371 Date Feb. 5, 1980, § 102(e) Date Feb. 5, 1980, PCT Pub. No. WO81/02277, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 5, 1980, Ser. No. 136,623

Int. Cl.[3] **B62D** *55/00*

U.S. Cl. 180—9.5 **10 Claims**



7. In a vehicle having an equalizer bar **(14)** pivotally mounted on bearing means **(24)** carried by a track frame **(16)**, an equalizer bar support assembly, comprising:

a flanged bearing support **(25)** having a cylindrical portion **(68)** axially projecting from a flanged portion **(70)**, said flanged portion **(70)** being mounted in said track frame **(16)**;

support means **(98,150)** secured to said cylindrical portion **(68)** remote from said flanged portion **(70)**, said support means **(98,150)** having means **(120,162)** operatively connected with said track frame **(16)** for securing said support means **(98,150)** to said track frame **(16)**; and

means **(100,164)** operatively associated with said support means **(98,150)** for limiting removal of said support means **(98,150)** from said track frame **(16)**.

4,324,304

CRAWLER-TYPE LOWER MACHINERY

Hiroshi Hashimoto; Masaru Kaneko, and Yoshihiro Kuge, all of Akashi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

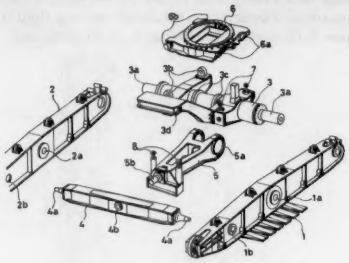
Filed Aug. 29, 1980, Ser. No. 182,778

Claims priority, application Japan, Sep. 5, 1979, 54/122586[U]

Int. Cl.[3] **B62D** *55/00*

U.S. Cl. 180—9.52 **2 Claims**

1. A crawler-type lower machinery comprising a pair of crawlers, left and right, a main frame and a rocking beam both connecting the two crawlers together, an intermediate frame connecting the main frame with the rocking beam, a table mounted on the main frame, and two groups of lift means arranged at right angles to each other, one group being located between the main frame and the table and the other between the intermediate frame and the main frame, said two crawlers when traveling being able to pitch and sway, independently of



each other, along the ups and downs of the ground, said lift means being operable so that the inclination of the table with respect to the crawler-bearing ground surface can be adjusted in every direction.

4,324,305

STEERING MECHANISM FOR EXCAVATORS AND THE LIKE

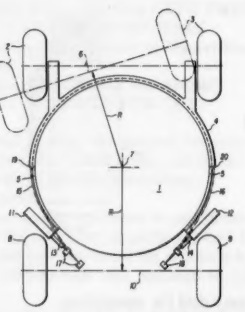
Ingebret Soyland, Solhogda 2, 4340 Bryne, Norway

Filed Aug. 28, 1980, Ser. No. 182,044

Claims priority, application Norway, Sep. 3, 1979, 792836

Int. Cl.[3] **B62D** *5/06, 53/02*

U.S. Cl. 180—134 **10 Claims**



1. A steering mechanism for an excavator or the like comprising:

(a) a generally circular-shaped rail carried by the excavator;

(b) a steering fork carried by the rail for movement in a generally circular path around the rail;

(c) first wheel means carried by the fork and having a first axis of rotation;

(d) second wheel means carried by the excavator and having a second axis of rotation; and

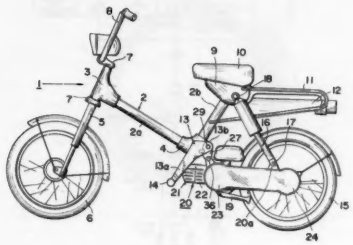
(e) wherein the center of the circle defined by the rail remains substantially equidistant from corresponding points of the first and second axes of rotation in all positions of the steering fork around the rail.

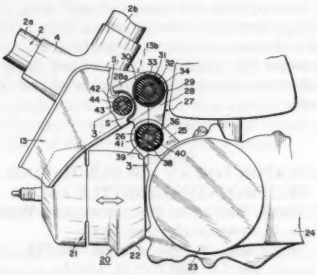
4,324,306

ENGINE SUPPORTING STRUCTURE FOR MOTORCYCLE

Takeo Ishihara, Asaka; Hidehiko Inoue, Saitama; Yuji Kishizawa, Kawagoe, and Tsutomu Hayashi, Hoya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,403
Claims priority, application Japan, Oct. 17, 1978, 53/127721
Int. Cl.³ B62K *11/04*
U.S. Cl. 180—228 **14 Claims**





1. In a motorcycle of the type in which a power unit is constructed integrally of an engine, a crankcase and a transmission case and which is swingable with respect to a frame together with a rear wheel, said rear wheel being supported by said power unit at a rear portion thereof and connected to said frame through a shock absorber; an engine supporting structure wherein:

said engine has the main axis of inertia thereof directed substantially in the longitudinal direction of said motorcycle;

at least one link is provided, said link having the lower portion thereof pivotally connected to said engine through a lower pivot and the upper portion thereof pivotally connected to said frame through an upper pivot;

said lower pivot and said upper pivot are arranged on a substantially vertical line so as to permit movement of said power unit, substantially in the direction of said main axis of inertia of said engine;

a stopper is provided on each said link; and

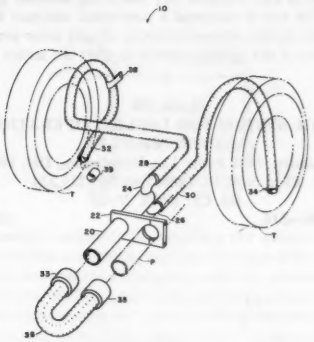
a member is provided on said frame in operative cooperation with each said stopper so as to regulate the pivotal motions of each said link.

4,324,307

SNOW/ICE MELTER FOR AUTOMOTIVE VEHICLES

Giuseppe Schittino, 2732 Maple Ave., and Vincent Schittino, 2829 Rosalie Ave., both of Baltimore, Md. 21234

Filed Apr. 3, 1980, Ser. No. 136,880
Int. Cl.³ B60B *39/02*
U.S. Cl. 180—313 **9 Claims**



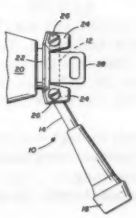
1. In a system for melting snow and ice by directing hot gas from a rearwardly extending motorvehicle exhaust pipe to the traction surfaces at the drive wheels through a conduit system having a rear part with a rear end, a middle part and a front part with distribution means, the improvement comprising: means for adjustably mounting the middle part of the conduit system to a motor vehicle, means for clamping the rear part of the conduit system adjacent the rear end of said exhaust pipe, means for connecting the rear of said exhaust pipe disconnectably to the rear part of the conduit system for ducting the hot gases therethrough, the distribution means including means for adjustably directing the hot gases from the front part of said conduit system to said traction surfaces, said means for connecting comprising a quick attach/detach tubing having first and second ends; the first end having provision for resilient friction-fit over the rear end of a said exhaust pipe, and the second end having provision for resilient friction-fit over the rear end of said rear part of the conduit system.

4,324,308

AID FOR STARTING MOTOR VEHICLES

Dorothy Clendenen, 205 Hampton Ct., Longview, Tex. 75601

Filed Nov. 29, 1979, Ser. No. 98,594
Int. Cl.³ B60K *26/00*; E05B *3/00*
U.S. Cl. 180—315 **3 Claims**



1. An apparatus for facilitating the starting of a motor vehicle having an ignition switch with a rotatable key receiving member, the rotatable key receiving member having a slot for insertion of an ignition key and flanges protruding therefrom on opposed edges of the slot, comprising:

a lever arm with a first end for being grasped and a second end for being mounted to the flanges of the rotatable key

receiving member, said lever arm further comprising a substantially straight portion dimensioned for abutting the flanges of the rotatable key receiving member without preventing insertion and withdrawal of the key into the slot therein and further including an angled portion extending outwardly to said first end; and

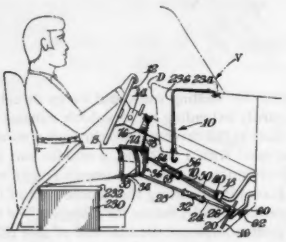
means for removably securing said lever arm to each of the flanges of the rotatable key receiving member such that said first end is disposed a prescribed distance from the ignition switch wherein rotation of said lever arm causes rotation of the ignition switch to start the motor vehicle.

4,324,309

CONTROL SYSTEM FOR LEGLESS OPERATION OF MOTOR VEHICLES

Maynard Ginley, 2404 Paper La., Wilmington, Del. 19810

Filed Nov. 28, 1980, Ser. No. 211,334
Int. Cl.³ B60K *26/02*
U.S. Cl. 180—316 **25 Claims**



1. A control system for the leg stump operation by a legless operator of a motor vehicle having a depressable accelerator and a depressable brake on the floor of the vehicle and having a steering wheel extending toward the driver's seat, comprising a rod secured to said accelerator and extending, toward said seat, leg stump-operated gas control means secured to said rod in the general area of said steering wheel for selectively moving said rod up and down in response to the movement of the stump to control the actuation of said accelerator, linkage secured to said brake and extending toward said seat generally alongside said rod, leg stump-operated brake control means secured to said linkage adjacent said stump-operated gas control means for actuating said brake in response to movement of the stump whereby the same stump of the operator may selectively actuate both said accelerator and said brake, and fastening means detachably mounting said leg stump to one of said control means.

4,324,310

SEISMIC APPARATUS

Kenneth R. Wener, and Anthony R. Tinkle, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Oct. 29, 1979, Ser. No. 89,063
Int. Cl.³ G01V *1/104*
U.S. Cl. 181—116 **5 Claims**

1. A seismic apparatus for high resolution seismic data acquisition, said seismic apparatus being inserted underground, said seismic apparatus comprising,

a cylindrically shaped breech having a formed interior space,

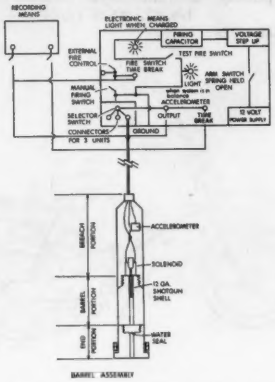
a cylindrically shaped barrel assembly having at least one formed barrel hole extending the longitudinal length of said barrel assembly, said barrel assembly being capable of releasably engaging said breech in fluid tight coupling,

a cylindrically shaped end portion releasably engaging said barrel assembly in fluid tight coupling for extending the longitudinal length of said at least one formed barrel hole,

an explosive seismic source selectively insertable in said at least one barrel hole between said barrel assembly and said breech,

a firing pin assembly located in said formed interior space of said breech operatively abutting said explosive seismic source,

a first seal mounted between said end portion and said barrel assembly across said at least one formed barrel hole for



providing a fluid seal to prevent fluids from entering said at least one formed barrel hole when said seismic apparatus is inserted into said hole, said seal being capable of rupturing when said explosive seismic source is fired, and

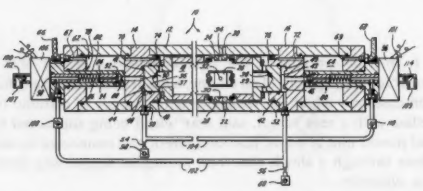
a second seal mounted between said seismic source and said firing means for preventing entry of said fluids into said formed interior space of said breech after said first seal is ruptured.

4,324,311

ACTUATOR FOR AN AIR GUN HAVING A RECIPROCATING SHUTTLE VALVE

Richard C. Farris, Dickinson, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Aug. 25, 1980, Ser. No. 180,788
Int. Cl.³ G01V *1/38, 1/137*
U.S. Cl. 181—120 **7 Claims**



1. In an air gun of the reciprocating shuttle type for underwater signalling, the gun having a firing chamber, a shuttle-actuation control chamber at each of opposite ends of the firing chamber for pneumatically reciprocating a shuttle valve back and forth in the firing chamber in alternate strokes, a solenoid vent valve and an air bleed valve fluidly communicating with each shuttle-actuation control chamber, the improvement comprising:

an air accumulator chamber having a pressurized-air inlet mounted adjacent each said shuttle-actuation control chamber;

a pneumatic poppet valve cooperating with each solenoid vent valve for selectively interconnecting first one and then the other of the air accumulator chambers with the adjacent shuttle valve actuation control chamber; and

an air passageway, including a choke, for interconnecting the firing chamber with each said air accumulator chamber.

4,324,312

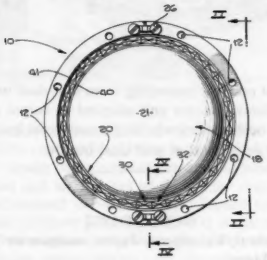
DIAPHRAGM SUSPENSION CONSTRUCTION

Howard M. Durbin, Tarzana, Calif., assignor to James B. Lansing Sound, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 960,597, Nov. 14, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,473

Int. Cl.[3] H04R *7/00*

U.S. Cl. 181—171 12 Claims



1. A suspension for loudspeakers, microphones or the like extending between an edge of a movable acoustic diaphragm and a fixed supporting member, comprising:

an annulus of thin sheet material, means providing said annular material with increased resistance to acoustic distortion, said means for stiffening said annulus material against flexing in a direction perpendicular to the plane of said annulus, said stiffening means operative to substantially increase the effective frequency at which anti-nodal resonance of the suspension annulus occurs.

4,324,313

EXPONENTIAL HORN FOR USE IN HORN-TYPE LOUDSPEAKERS

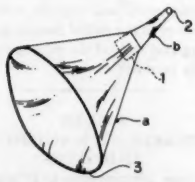
Tomiyo Nakagawa, 65 Kasuga Ouji, Ryoutsu-shi, Niigata, Japan

Continuation of Ser. No. 18,715, Mar. 8, 1979, abandoned. This application May 19, 1980, Ser. No. 151,444

Claims priority, application Japan, Aug. 1, 1978, 53-94275

Int. Cl.[3] G10K *11/00*

U.S. Cl. 181—192 2 Claims



1. An exponential horn for use in a horntype loudspeaker, comprising a duct of gradually increasing vertical cross-section and ending with a mouth substantially in the form of an ellipse, and the cross-section of the horn intersected by a plane which passes through the longitudinal axis of the horn and the semi-major axis of said ellipse defining a substantially V-shape of a large included angle and of substantially straight sides and the cross-section of the horn intersected by a plane which passes through the longitudinal axis of the horn and perpendicular to the semi-major axis of said ellipse is a curved line.

4,324,314

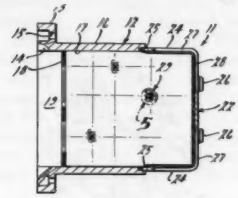
MUFFLER

Earl Beach, Royal Oak, and Calvin Matle, Farmington, both of Mich., assignors to Ross Operating Valve Company, Detroit, Mich.

Filed Sep. 30, 1980, Ser. No. 192,314

Int. Cl.[3] F01N *1/24*

U.S. Cl. 181—230 14 Claims



1. A muffler assembly for muffling the exhaust of an air valve or the like comprising an outer housing defining an inlet adapted to be positioned in registry with the exhaust outlet of an air valve or the like, said housing defining an internal cavity in communication with said inlet, an exhaust in communication with said cavity, a packing of sound deadening material in it at least a portion of said cavity interposed in the path of flow from said inlet to said exhaust, said packing being comprised of a knitted mesh of fibers, a perforated baffle positioned between said inlet and the inlet end of the packing for attenuating sound and for protecting said packing from air blast damage, and an anti-extrusion screen positioned in engagement with the exhaust side of said packing for preventing discharge of said packing from said outer housing exhaust.

4,324,315

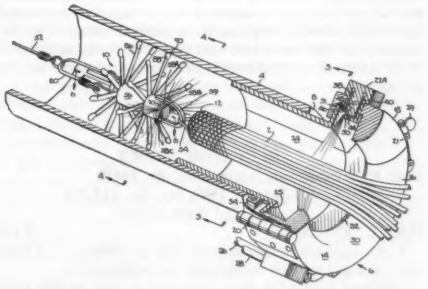
APPARATUS FOR LUBRICATING ELECTRICAL CABLE

Webster T. Charlton, Lowell, Mass., assignor to Stone and Webster Eng. Cor., Boston, Mass.

Division of Ser. No. 39,484, May 15, 1979, Pat. No. 4,296,837. This application Feb. 19, 1981, Ser. No. 235,789

Int. Cl.[3] F16N *7/00*

U.S. Cl. 184—15 R 5 Claims



1. An apparatus for uniformly distributing lubricant over a cable being pulled through a conduit at the entry end of the conduit continuously as the cable moves through the conduit comprised of:

an adjustable flanged sleeve;

means for releasibly securing the adjustable flanged sleeve to the entry end of the conduit with the flange projecting from the conduit;

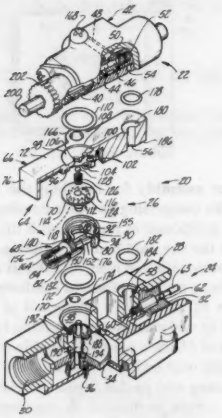
a ring adapted to be mounted on the flange; and

a plurality of nozzles located equidistantly around the ring facing the cable.

4,324,316
INJECTION LUBRICATOR CONTROLLED BY COUNTING MECHANISM

George E. Thrasher, Jr., Pontiac, and David Lombardi, Sterling Heights, both of Mich., assignors to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

Filed Jan. 28, 1980, Ser. No. 115,680
Int. Cl.[3] F16N 13/16
U.S. Cl. 184—29 30 Claims



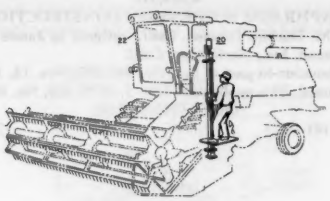
28. In a lubricator constructed and arranged to be mounted in a primary air line through which air under pressure is furnished to pneumatically operated equipment to be lubricated and having a pump communicating with said primary air line so that pulses of air under pressure in such primary air line are transmitted to said pump for operating said pump to emit a predetermined quantity of lubricant for lubricating such equipment, the improvement comprising: a movable valve member controlling the flow of air under pressure to said pump operating the same and constructed and arranged to open on an incremental movement thereof and to remain closed during a plurality of incremental movement thereof, and a pneumatically actuated operating mechanism communicating with said primary air line and constructed and arranged to incrementally move said valve in response to successive pulses of air in said primary air line such that said pump operates only once for each series of a predetermined number of such successive pulses of air.

4,324,317
ELEVATOR DEVICE

Dean R. Winkelblech, Aaronsburg, Pa. 16820

Filed Jan. 28, 1980, Ser. No. 115,713
Int. Cl.[3] B66B 11/04
U.S. Cl. 187—25 7 Claims

1. An elevator device adapted for attachment to a substantially upright surface comprising in combination:
a hollow support member attached to said upright surface;
an electric motor attached to said support member;
a screw rotatably coupled to said electric motor and extending within said support member;
a support nut rotatably engaged with said screw;
an inner slide connected to said support nut and in sliding contact with the interior surface of said hollow support member;
a platform member attached to said inner slide, said platform member comprising in combination:
a platform support member attached to said inner slide;
a platform adjusting member rotatably attached to the middle portion of said platform support member;
a platform rotatably attached to said platform adjustment member, said platform being rotatably hinged to said platform support member;
a hand grip member attached to said inner slide;
a dual button attached to said hand grip member;

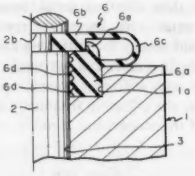


an electrical conduit extending from said dual button device to said electric motor and adapted to rotate said electric motor in both a clockwise and counterclockwise direction upon the activation of said dual button.

4,324,318
DUST COVER

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Mar. 13, 1980, Ser. No. 130,117
Claims priority, application Japan, Mar. 20, 1979, 54-32492
Int. Cl.[3] F16D 65/02
U.S. Cl. 188—73.31 3 Claims



1. A dust cover formed of a tubular flexible material and provided between a shaft and a body member which has a bore fittingly receiving the shaft therein, one end of the dust cover sealingly engaging with the outer circumference of the shaft and with the inner circumference of the body member, the other end of the dust cover sealingly engaging with the outer circumference of a portion of the shaft projecting out of the body member, and an annular lip which is formed on either of said ends of the dust cover and engages with the other of said ends of the dust cover in the radial direction, and a connecting portion connecting said ends of the dust cover for covering the shaft and the body member.

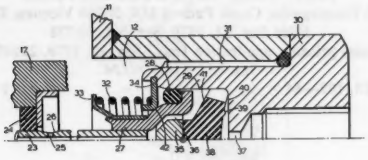
4,324,319
VEHICLE BRAKES WITH AUTOMATIC SLACK ADJUSTERS

Anthony W. Harrison, Birmingham, and Peter W. Brown, West Midlands, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 16, 1979, Ser. No. 85,396
Claims priority, application United Kingdom, Oct. 21, 1978, 41474/78; Jan. 25, 1979, 02616/79
Int. Cl.[3] F16D 65/60
U.S. Cl. 188—79.5 K 20 Claims

1. A brake for a vehicle comprising a rotatable braking member, a friction member for engagement with said rotatable braking member, a fluid pressure operated acutator, comprising a housing and relatively movable parts located in said housing, said actuator being adapted to urge said friction mem-

ber into engagement with said braking member, an automatic adjuster for automatically maintaining predetermined brake clearances, a supply of pressure fluid for operating said adjuster, and a valve assembly for controlling supply of said pressure fluid to operate said adjuster, said valve assembly being operable to supply said pressure fluid to operate said adjuster when relative movement between the said parts of said actuator exceeds a predetermined value, and said valve assembly comprises a first valve means and a second valve



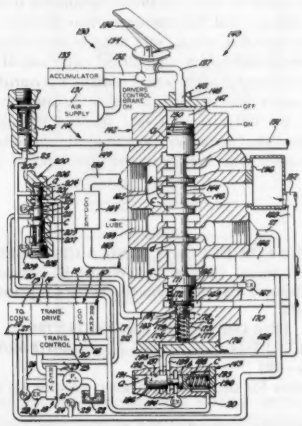
means disposed between said first valve means and said adjuster, said first valve means being normally closed and said second valve means being normally open, and when said actuator is operated and adjustment of said brake clearances is not required, said second valve means is adapted to close in response to fluid pressure generated by said actuator before said first valve means opens, and when adjustment is required, said first valve means opens before said second valve means can close to supply said fluid to operate said adjuster.

4,324,320

POWER LIMITING CONTROL FOR RETARDER WITH FRICTION BRAKE

Stephen F. Spurlin, Indianapolis; Carl A. Lentz, Mooresville, and Clement P. Miller, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1979, Ser. No. 50,514
Int. Cl.³ F16F *11/00*; B60K *41/20*
U.S. Cl. 188—271 **14 Claims**



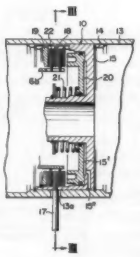
1. In a brake assembly: hydrodynamic means having a bladed stator and a bladed rotor mounted for rotation at varying speeds forming a brake chamber with an inlet delivering inlet pressure to said chamber and an outlet operative during rotation of said rotor with fluid in said brake chamber to pump fluid from said inlet to said outlet and to provide hydrodynamic brake torque increasing with speed and said inlet pressure; the improvement comprising: supply means for providing fluid under pressure having a regulated pressure varying with speed to provide a pressure increasing in proportion to hydrodynamic brake torque as it increases with speed up to a maximum pressure in a low speed range and decreasing in proportion to increasing speed in a high speed range; brake control means connected to said inlet and said supply means and including an exhaust and brake demand signal means providing a brake demand signal operative in brake-off position to connect said inlet to said exhaust, and in the brake-on position to connect said outlet to said inlet and to regulate the fluid pressure supplied to said inlet by selectively connecting said inlet to said exhaust and connecting said supply means to said inlet to regulate the pressure in said inlet and said brake chamber proportional to said brake demand signal from said brake demand signal means at pressure values up to said maximum pressure of said supply means varying with speed to provide hydrodynamic brake torque increasing with speed up to a maximum in said low speed range and to provide up to a decreasing hydrodynamic brake torque with increasing speed in said high speed range to reduce the increase of hydrodynamic brake power with increasing speed in the high speed range.

4,324,321

AUTOMATIC TRANSMISSION FOR AUTOMOBILES

Fumihiro Ushijima, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 13, 1980, Ser. No. 120,999
Claims priority, application Japan, Mar. 9, 1979, 54-27955
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—13 R **2 Claims**



1. An automatic transmission for automobiles, comprising a housing having an opening therethrough, an input shaft, and output shaft, a gear means having a power input element, a first friction engaging means including a first oil servo means and selectively connecting said input shaft with said power input element, a second friction engaging means including a second oil servo means and selectively braking said power input element, the engagement of said first friction engaging means effecting a first speed stage while the engagement of said second friction engaging means effects a second speed stage, said second friction engaging means having first and second mutually engageable friction elements and a spline member which engages said first friction element, a projection fixedly secured to said spline member and extending substantially radially therefrom so as to pass through said opening in said housing, said spline member being mounted to said housing to be rotatable in it with respect to it through a small angle, said second friction element being connected with said power input member, said power input member being driven by said input shaft in a first rotational direction when said first friction engaging means is engaged in engine driving, said power input member being driven by said output shaft in said first rotational direction when said second friction engaging means is engaged in engine braking, said power input member being driven by the reaction to rotation of said output shaft in a second rotational direction opposite to said first rotational direction when said second friction engaging means is engaged in engine driving, a

load cell actuated by said projection when said projection is driven in one of said first and second rotational directions so as to generate an electric signal, and an oil pressure circuit means including a source means of oil pressure, a shift valve for changing over supplying of oil pressure from said source means to one of said first and second oil servo means while changing over exhausting of oil pressure from the other of said first and second oil servo means, a pressure modulating valve which has first and second ports and produces a reduced pressure of a predetermined level at said second port from the oil supplied to said first port from said source means, a passage which connects said shift valve and said second oil servo means and which includes a main passage and a bypass passage, said bypass passage including said pressure modulating valve, and a timing valve which changes over said passage between said main passage and said bypass passage in accordance with said electric signal so that said timing valve changes over said passage to said main passage when said projection is driven in said second rotational direction and said timing valve changes over said passage to said bypass passage when said projection is driven in said first rotational direction.

4,324,322

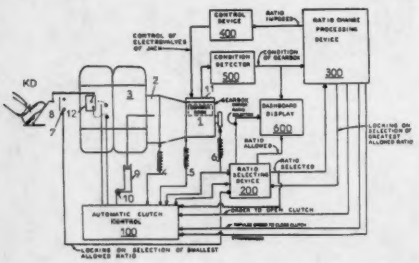
METHOD FOR THE AUTOMATIC CONTROL OF A GEARBOX, IN PARTICULAR ON A MOTOR VEHICLE

Jean-Paul Sibeud, Chaponnay, France

Continuation-in-part of Ser. No. 594,571, Jul. 9, 1975, abandoned. This application Sep. 28, 1978, Ser. No. 946,508

Int. Cl.³ B60K *41/28, 41/04*

U.S. Cl. 192—0.032 **22 Claims**



1. A method for controlling a gearbox with a plurality of gear ratios provided with dogs, on a vehicle which includes, an engine, a clutch, means for opening and closing said clutch, gearbox control means, gearbox condition detector means, memory means, ratio selection means, means for determining rotational speeds of input and output shafts of said gearbox, engine speed control means, means for determining the speed of said engine, means for determing the acceleration of said vehicle, and means including controls for effecting a sequence of operations, which operations are carried out automatically and including electrical and electronic circuits which operate as loop chains, comprising:

(a) opening the clutch;

(b) putting said gearbox into neutral, by means of said gearbox control means;

(c) selecting the largest gear ratio n′ of more than one gear ratios useable at the existing speed of said vehicle;

(d) memorizing by said memory means an electrical binary code representing said selected gear ratio n′, and simultaneously memorizing by said memory means data representing the character of a change in gear ratios;

(e) using said gearbox control device to place said gearbox into said selected gear ratio n′;

(f) simultaneously closing said clutch;

(g) using said gearbox condition detector to determine whether the gearbox is in said selected gear ratio n′, with the dogs of gear ratio n′ meshed together;

(h) comparing selected gear ratio n′ with the condition of said gearbox as determined by said gearbox condition detector to determine whether said condition is equivalent to said selected gear ratio; and

(i) if said condition is equivalent to said selected gear ratio, cancelling said date memorized in said memory means to prepare for a new cycle.

4,324,323

FREEWHEEL DEVICE FOR BICYCLES

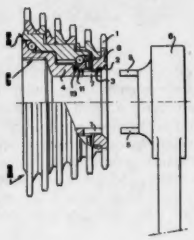
Tullio Campagnolo, Corso Padova 168, 36100 Vicenza, Italy

Filed Jun. 21, 1979, Ser. No. 50,778

Claims priority, application Italy, Jun. 23, 1978, 22169 B/78

Int. Cl.³ F16D *41/24*

U.S. Cl. 192—64 **1 Claim**



1. A freewheel device for bicycles, comprising an inner body, an outer body mounted for rotation on the inner body, a plurality of sprocket wheels of different size mounted on the outer body, a smallest sprocket wheel on the outer end of the inner body, the outer end of the inner body being hollow and cylindrical, the inner diameter of the smallest sprocket wheel being almost equal to the outer diameter of said end of said inner body, and a plurality of axially extending notches in said outer end of said inner body for the reception of a spanner, said notches having an axial extent greater than the axial extent of said smallest sprocket wheel, said notches extending radially entirely through said hollow cylindrical outer end of the inner body, said smallest sprocket wheel radially outwardly closing the radially outer sides of said notches at the outer ends of said inner body, the outer side of said smallest sprocket wheel having a bevel that terminates at the inside diameter of said smallest sprocket wheel at about the outer end of said inner body.

4,324,324

APPARATUS FOR DECLUTCHING A GEAR SELECTOR

Edward H. Priepke, Stevens, and Wayne B. Martenas, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Oct. 1, 1980, Ser. No. 192,786

Int. Cl.³ F16D *43/00;* G05G *17/00;* A01D *69/08*

U.S. Cl. 192—101 **7 Claims**

1. Apparatus for declutching a gear selector on a vehicle comprising:

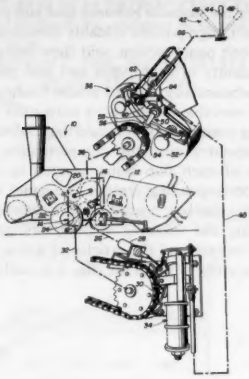
means operably connected for moving said gear selector between a forward and a neutral position;

a first link connected to said gear selector means, said first link including a first end having a retainer and a second end having a stop;

a second link having a first end pivotally connected to said first link adjacent said stop and having a slide at a second end, said slide connected to said vehicle;

means connected for moving said first and second links between a first position wherein said stop engages said first end of said second link and said gear selector means is in a forward mode, and a second position wherein said

stop is out of engagement with said first end of said second link and said gear means is in a neutral mode; and



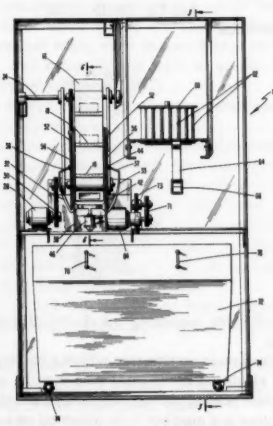
resilient means for maintaining said links in said first position and for urging said links into said second position, said resilient means interconnecting said retainer and said slide.

4,324,325

APPARATUS FOR COLLECTION OF METALLIC CONTAINERS AND METHOD THEREFOR

Bruce H. Dewoolfson, 2200 Columbia Pike #1113, Arlington, Va. 22204

Filed Dec. 21, 1979, Ser. No. 106,104
Int. Cl.[3] G07F *7/06*
U.S. Cl. 194—4 C **14 Claims**



1. Apparatus for collcting and storing empty aluminum containers and for issuing payment for containers collected, comprising:

preselection means for passing an electric current directly through a crushed or non-crushed conainer offered by a customer for identifying whether said container is substantially aluminum, said preselection means including a container access area configured to accommodate both crushed and non-crushed containers for passage of said electric current;

means for accepting only a container identified by said preselection means as being substantially aluminum, independent of the configuration of said container;

dispensing means responsive to said preselection means for dispensing payment in return for containers having a substantially aluminum composition;

means cooperating with said accepting means for crushing said containers; and

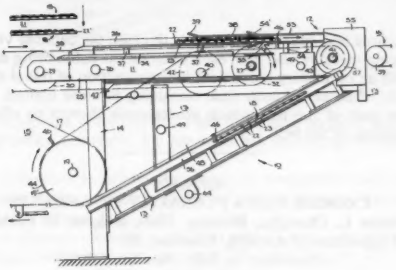
means for storing crushed containers received from said crushing means.

4,324,326

DISCHARGE ASSEMBLY FOR AN OVEN

Rouzas R. Khoylian, Belmont, Mass.; James R. Cowdery, Pellham, N.H., and David B. Park, Wilmington, Mass., assignors to Design + Process Engineering Inc., Billercia, Mass.

Filed Feb. 19, 1980, Ser. No. 122,247
Int. Cl.[3] B65G *47/31, 47/84*
U.S. Cl. 198—461 **14 Claims**



1. In combination

a vertically disposed elevator for conveying a series of flexible carriers in a descending path;

a transfer conveyor having hook means for engaging a forward end of a carrier on said elevator and means for moving said hook means in an endless path having an upper longitudinal run and a lower run;

a discharge conveyor having a bar means for engaging the forward end of a carrier on said transfer conveyor, means for moving said bar means in an endless path having a horizontal run, a downwardly directed run extending from said horizontal run and a return run extending between said downwardly directed run and said horizontal run; said horizontal run being disposed in overlapping relation with said upper run of said transfer conveyor to permit transfer of a carrier on said transfer conveyor to said horizontal run of said discharge conveyor; and

a main conveyor having second hook means for engaging the forward end of a carrier and means for moving said second hook means in an endless path having a section coincident with said endless path of said discharge conveyor between said downwardly directed run and said return run.

4,324,327

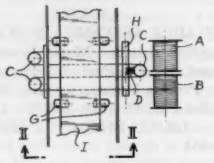
METHOD AND APPARATUS FOR CLEANING CONVEYOR BELTS BY MEANS OF A VIBRATING CABLE OR GROUP OF CABLES

Henri Chouteau, Villa Bel Air, Montgobert 02600 Villers-Cotteret, and Gilbert Lagros, 4, rue de Nahan, 54490 Piennes, both of France

Filed Aug. 5, 1980, Ser. No. 175,587
Claims priority, application France, Aug. 10, 1979, 79 20487
Int. Cl.[3] B65O *45/00*
U.S. Cl. 198—497 **12 Claims**

1. A method of clęaning a conveyor belt comprising arranging a cable transversely, relative to the direction of travel of the belt, between two support points independent of the belt and in contact with the underside of the belt when the belt is slack, and raising lateral edge portions of the slack belt with respect to the central portion of the belt by positioning each

support point for the cable slightly above a plane defined by the slack belt in the rest position when the belt is not subjected to any stress from the cable, whereby a tension is produced in the cable, which thus exerts a pressure on the belt over the entire width of the belt, the pressure being a minimum at the longitudinal axis of symmetry of the belt and increasing



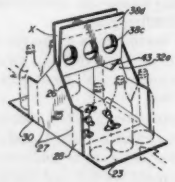
towards said edge portions, so as to cause the cable to vibrate during travel of said belt, each point on the cable being driven with an oscillatory movement in the direction of travel of the belt, while at the same time remaining in close contact with that part of the belt which corresponds thereto to effect a cleaning of the belt.

4,324,328

CARRIER FOR A PLURALITY OF ARTICLES

Charles L. Champlin, Rittman, Ohio, assignor to Packaging Corporation of America, Evanston, Ill.

Filed May 12, 1980, Ser. No. 149,021
Int. Cl.³ B65D *75/04*
U.S. Cl. 206—194 **8 Claims**



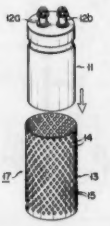
1. A carrier formed from a blank of foldable sheet material for manually carrying a plurality of necked articles arranged in a pair of substantially parallel coextensive rows, said carrier comprising a base panel for subtending and supporting the rows of articles, said base panel having opposed first peripheral segments and opposed second peripheral segments; a pair of opposed end panels foldably connected to and extending upwardly from said base panel first peripheral segments, each end panel being positionable adjacent corresponding end articles of the rows of articles subtended and supported by said base panel; an elongated handgripping unit spanning the distance between upper portions of said upright end panels and being provided with elongated panel sections disposed in substantially face-to-face relation and substantially spanning the distance between said end panels, said panel sections defining a plane substantially perpendicular to said base panel and extending between the rows of articles, corresponding elongated upper portions of said panel sections being foldably interconnected and corresponding lower portions of said panel sections extending into the carrier interior and being spaced from said base panel; first means foldably interconnecting corresponding end portions of said panel sections to separate upper peripheral portions of an adjacent end panel; a pair of opposed side panels foldably connected to and extending upwardly from said base panel second peripheral segments; second means foldably interconnecting adjacent portions of said side and end panels and retaining same in upright angular relation, said unit panel sections, and said side, end and base panels coacting to form substantially contiguous open top compartments separated by the plane defined by said substantially face-to-face panel sections, each compartment being adapted to accommodate at least one row of articles; and article-retaining flaps substantially spanning the distance between said end panels, each flap having an inner edge portion foldably connected to the lower portion of a unit panel section, said flaps being initially movable independently of each other and said panel sections to inoperative substantially upright article-loading positions and subsequently movable to operative outwardly extending article-restraining positions wherein said flaps substantially overlie and close respective open top compartments, and an outer-edge portion of each flap being secured to an upper edge portion of a corresponding upright side panel, each flap being provided with relatively spaced third means for supportingly accommodating and retaining in predetermined spaced relation the neck portions of the articles of a row disposed in an adjacent compartment when the flap is in said operative position.

4,324,329

DEVICE FOR MOUNTING AN ELECTRICAL CIRCUIT COMPONENT PART SUCH AS AN ELECTROLYTIC CAPACITOR

Isao Tani, 1-36-8, Kaname-cho, Toshima-ku, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,527
Claims priority, application Japan, Jan. 19, 1979, 54-5172[U]; Jun. 21, 1979, 54-78540[U]; Jun. 21, 1979, 54-85352[U]; Jun. 29, 1979, 54-89417[U]
Int. Cl.³ B65D *73/02*
U.S. Cl. 206—328 **6 Claims**



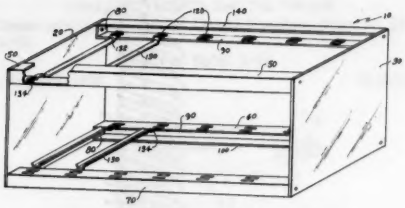
1. A device for mounting an electrical component part, comprising:

a cylindrical main section into which a corresponding cylindrical electrical component part may be inserted; and a base plate sealing one end of the cylindrical main section and acting as a member to be mounted on a mounting base plate, said cylindrical main section and base plate being formed of elastic synthetic resin such that they are integral with each other, in which said cylindrical main section comprises a combination of a plurality of strips which are diagonally arranged in two directions to form meshes and disposed in symmetry with respect to the axis of the cylindrical main section, and wherein those strips diagonally arranged in one direction project within the cylindrical main section to an extent greater than those strips diagonally arranged in the other direction to permit only said strips diagonally arranged in said one direction to contact the outer peripheral surface of said cylindrical electrical component part when said component part is inserted.

4,324,330
CARD CAGE FOR ELECTRONIC CIRCUIT CARDS

David J. Durney, Holland, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 7, 1980, Ser. No. 147,510
Int. Cl.[3] A47G *19/08*
U.S. Cl. 206—328 2 Claims

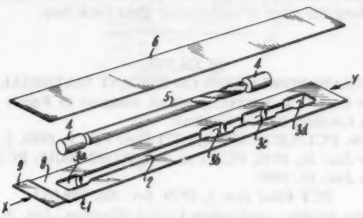


1. An electronic circuit card cage including
two end plates,
spaced-apart first and second upper support members adjustably secured between said end plates,
said first and second upper support members each having a horizontal upper connector wall, both said upper connector walls lying in a first common horizontal plane,
first arcuate bridges formed on said upper connector walls of said first and second upper support members and defining therewith spaces into which members can be inserted, said arcuate bridges being spaced apart on the length of said upper connector walls, each arcuate bridge on one upper connector wall being aligned with an arcuate bridge on the other upper connector wall,
spaced-apart first and second lower support members adjustably secured between said end plates,
said first and second lower support members each having a horizontal lower connector wall, both said lower connector walls lying in a second common horizontal plane,
second arcuate bridges formed on said lower connector walls of said first and second lower support members and defining therewith spaces into which members can be inserted, said arcuate bridges being spaced apart on the length of said lower connector walls,
each second arcuate bridge on one lower connector wall being aligned with an arcuate bridge on the other lower connector wall,
said first and second horizontal planes being spaced from each other and defining a space within which electronic circuit cards can be positioned, and
first channel-shaped elongated card-support members coupled between said first and second upper support members, and second channel-shaped elongated card-support members coupled between said first and second lower members, all of said first and second channel-shaped members having end portions which enter the spaces formed by and engage said arcuate bridges whereby each channel-shaped member can be secured in place between aligned arcuate bridges on a first and on a second upper or lower support member,
each first channel-shaped member being disposed vertically above a second channel-shaped member with the first member facing down and the second member facing up so that an electronic circuit card can be inserted between them and supported in their facing channels.

4,324,331
PACKAGING FOR SURGICAL IMPLEMENTS

Michael J. Ignasiak, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Aug. 8, 1980, Ser. No. 176,368
Int. Cl.[3] B65D *85/20, 85/24, 81/04*
U.S. Cl. 206—363 9 Claims

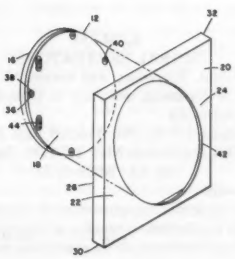


1. A storage container for rigid elongated surgical implements which is suitable for pre-sterilized packaging comprising:
(a) a bottom assembly containing an elongated cavity for receiving an implement wherein said cavity has a first end and a second end;
(b) a plurality of areas at the first end of said cavity spaced apart longitudinally from each other and capable of containing a protective plug, such that the plug will be retained in the area in the bottom assembly upon dispensing of the product from the container;
(c) at least one protective plug for selectively positioning in at least one of said areas in order to selectively accommodate various length implements in the cavity, while restricting the amount of longitudinal movement of the implement in the cavity and protecting the implement from hitting the end of the cavity, each said plug being made of any suitable material soft enough not to damage the surgical implement, yet rigid enough not to generate particulate flakes onto the surgical implement; and
(d) a lid portion capable of being sealed to the bottom assembly to retain the implement until ready for dispensing.

4,324,332
MIRROR PACKAGE

Larry G. Willis, Vincennes, Ind., assignor to Hamilton Glass Products Incorporated, Vincennes, Ind.

Filed Oct. 23, 1980, Ser. No. 199,844
Int. Cl.[3] B65D *85/48*
U.S. Cl. 206—454 10 Claims



1. A package comprising a mirror glass or like flat article and a formed blank of semirigid sheet material, said formed blank comprising a central panel rigidly affixed to the back face of said mirror glass, said central panel having a border extending beyond the edge of said mirror glass in all directions, said

formed blank further comprising flange portions folded out of the plane of said central panel and extending in a direction from said plane toward the side of said plane on which said mirror glass is affixed, providing a spacing means to protect the front face of said mirror glass, said central panel being adapted to be readily severed to remove said border and said flanges by means which would assist in such severance including a firm and rigid affixation of said central panel at least throughout the area along the edge of said mirror glass back face.

4,324,333

TRANSPORTATION OF FLUENT MATERIAL

Harold Porter, Tallentyre, England, assignor to Porter Chadburn Limited, Bootle, England

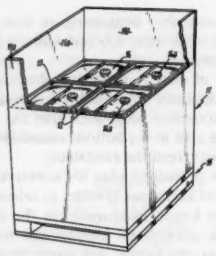
PCT No. PCT/GB79/00096, § 371 Date Feb. 3, 1980, § 102(e) Date Jan. 24, 1980, PCT Pub. No. WO80/00019, PCT Pub. Date Jan. 10, 1980

PCT Filed Jun. 1, 1979, Ser. No. 189,953

Claims priority, application United Kingdom, Jun. 3, 1978, 26317/78

Int. Cl.³ B65D *85/62, 77/06, 19/02, 5/48*

U.S. Cl. 206—526 **11 Claims**



2. A transportable module for the bulk transportation of fluent materials comprising a self-supporting outer cardboard container, a plurality of adjacent mutually supporting cardboard dividers of tubular form within the outer container and defining a plurality of individual and adjacent compartments in the said container, whereby there are walls separating adjacent compartments which are of a multiple thickness substantially equal to like multiple thickness walls existing between a compartment and the exterior of the outer container, and a filled flexible bag having a closable inlet provided therein disposed within each respective compartment and existing as a tight fit therein, each compartment and the bag therein having a dimension in the axial direction of the compartment in excess of the transverse dimension of such compartment.

4,324,334

SPIRAL SEPARATORS

Douglas C. Wright, Terranora, and Sidney N. Roberts, Banora Point, both of Australia, assignors to Inheed Pty Ltd., Murwillumbah, Australia

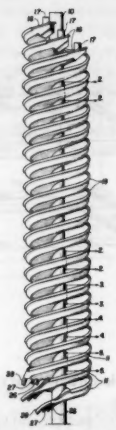
Continuation-in-part of Ser. No. 116,629, Jan. 29, 1980, Pat. No. 4,277,330. This application May 21, 1981, Ser. No. 265,799

Int. Cl.³ B03B *5/52*

U.S. Cl. 209—459 **6 Claims**

1. A spiral separator supported with its axis substantially vertical which is adapted to receive at an upper end thereof a pulp of water and minerals to be separated, said spiral separator including:

a plurality of helical turns wherein the bottom of each turn in cross section includes a substantially straight or flat portion and an outer portion, said straight portion being inclined at an angle to horizontal and said outer portion being inclined upwardly relative to the straight portion, characterized in that the angle to horizontal of the straight portion of each or adjacent groups of turns progressively decreases from top to bottom throughout at least two turns in the lowermost part of the length of the spiral separator to thereby develop a braking effect on the flow of pulp which comprises heavy particles, light particles and intermediate size particles, whereby the flow of light particles throughout the said substantial part of the spiral separator is gradually shifted



outwardly from the flow of heavy particles and intermediate size particles to facilitate subsequent separation of the light particles from said heavy and intermediate size particles; and

dividing means for dividing said light particles from said heavy particles and intermediate particles and means for withdrawing said light particles from said heavy and intermediate size particles separately.

4,324,335

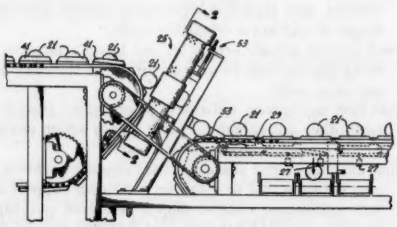
METHOD AND APPARATUS FOR MEASURING THE SURFACE SIZE OF AN ARTICLE

Tim D. Conway, El Cerrito, and Paul F. Paddock, Riverside, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Division of Ser. No. 917,724, Jun. 21, 1978, Pat. No. 4,246,098. This application Feb. 19, 1980, Ser. No. 122,449

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—586 **14 Claims**



1. Apparatus for measuring the size of the surface of an article, said apparatus comprising:

means defining an examining region;

means operable when the article is disposed in said examining region for illuminating the surface of the article;

means for sensing light reflected from the surface and producing a plurality of light intensity measurements, each of said measurements corresponding to the intensity of light reflected from a discrete segmental area on the surface, each of said segmental areas having substantially the same

predetermined size, the segmental areas together forming substantially the entire surface of the article; and

means for receiving the plurality of light intensity measurements and counting the number of segmental areas on the surface, thereby producing a measure of the size of the surface.

4,324,336

SEPARATING APPARATUS

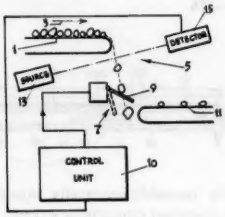
Hans A. Sandbank, London, England, assignor to Andrex N.D.T. Products (U.K.) Limited, Wembley, England

Filed Feb. 16, 1977, Ser. No. 769,053

Claims priority, application United Kingdom, Mar. 11, 1976, 9763/76

Int. Cl.³ B07C *5/34*

U.S. Cl. 209—589 **11 Claims**



1. An apparatus for separating objects of a particular kind from a stream of falling objects comprising:

sensing means comprising a radiation sensor and a source of radiation arranged to direct a beam of said radiation onto said sensor, which beam is interrupted by the falling objects, so that objects of said particular kind are detected because they consist of a material that attenuates said radiation differently from the material of the other objects;

a separating mechanism including at least one movable separating member which is positioned downstream of said sensing means along the path of the falling objects;

and control means for controlling said separating mechanism in response to the output of said sensing means so that after detection of an object by said sensing means said separating member is moved with respect to the path of the falling objects so that objects of said particular kind are directed in a first direction and other objects are directed in another direction;

and including the improvement that the sensing means produces an output representative of a physical dimension of each detected object, and the control means controls said separating mechanism after detection of an object by the sensing means so that said separating member is moved only when the strength of the radiation received by said sensor when that object interrupts said beam of radiation has a predetermined relation with respect to a threshold value, which threshold value depends on the said physical dimension of that object.

4,324,337

ARTICLE SUPPORT RACK

Raimo K. Hermalahti, 12 Johnston St., Southport, Queensland, 4215, Australia

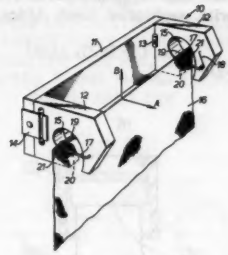
Filed Mar. 31, 1980, Ser. No. 135,924

Claims priority, application Australia, Sep. 13, 1978, PD5922; Sep. 13, 1979, 50840/79

Int. Cl.³ A47F *5/08*

U.S. Cl. 211—89 **8 Claims**

1. A hanging assembly including a supporting body having a recess therein; latch means pivotally connected to said supporting body at a pair of spaced pivot points at one side of said recess whereby said latch means is pivotable between an operative position at which said latch means engages against the opposite side of said recess to close same, and an inoperative position at which said latch means is spaced from said opposite



side and characterized in that one said pivot point is eccentrically disposed relative to the other said pivot point whereby said latch means is urged away from said inoperative position to said operative position.

4,324,338

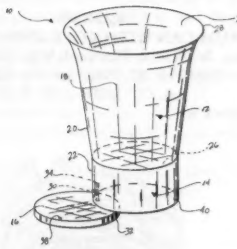
COMPARTMENTED CONTAINER

Robert Beall, Rte. 10 Bon Gor Lake, Columbia, Mo. 65201

Filed Dec. 27, 1979, Ser. No. 106,893

Int. Cl.³ B65D *85/00*

U.S. Cl. 215—6 **10 Claims**



1. A reusable compartmented container adaptable for holding a liquid and a non-liquid substance therein comprising a body member having a first substantially cup-like portion for holding the liquid substance therein and a second portion defining a second compartment for receiving and holding the non-liquid substance therein, said body member having first and second ends and a closed side wall portion extending therebetween, a wall member disposed at an intermediate location along the closed side wall portion separating the cup-like portion from said second compartment, a movable reclosable closure member attached to the closed side wall portion of said body member adjacent to the second end thereof, said closure member, said closed side wall portion and said wall member defining the second compartment, said closure member including means associated therewith for hingedly attaching said closure member to the second end of the closed side wall portion thereby enabling said closure member to be rotatable relative to the second end portion of said body member between a position closing the second compartment and a position providing access thereto, said first end of said body member being flared outwardly to facilitate drinking therefrom.

4,324,339

SAFETY DEVICE FOR USE WITH A CONTAINER

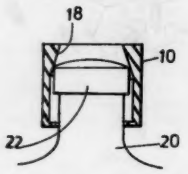
Oliver T. Spedding, 21 Oak Tree Plots, Krugersdorp, Transvaal, South Africa

Filed Aug. 13, 1980, Ser. No. 177,733

Claims priority, application South Africa, Aug. 14, 1979, 79/4263

Int. Cl.[3] B65D *55/02*

U.S. Cl. 215—219 3 Claims



1. In combination, a container with a neck to which is fitted a screw cap which has an end wall and a side wall, said side wall being generally right cylindrical, and a safety device having a lower annular body portion into which said cap is insertable and within which is freely rotatable and a deformable portion near the mouth of said annular body portion which impedes withdrawal of said cap from said safety device, and said safety device also having an upper inwardly-tapered inner wall surface which is frictionally engageable with said cap at the junction of said end wall and said side wall when said safety device is forced axially towards said container, so that said cap and said safety device are prevented from being rotated relative to each other and can be rotated together relative to the container.

4,324,340

ALUMINUM CAN WITH COLLAPSIBLE SIDEWALL

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

Filed Feb. 25, 1980, Ser. No. 123,990

Int. Cl.[3] B65D *1/40, 8/04*

U.S. Cl. 220—1 R 21 Claims

1. A metal container adapted to be axially collapsed when exhausted of its contents, comprising: an endless peripheral metal sidewall generally of right circular cylindrical shape and having open opposite end portions each provided with a closure member to afford an inner chamber for the contents of the container, access to the chamber being provided through one of the closure members, the sidewall being provided with a plurality of similar adjacent annuli each positioned substantially perpendicular to the axis of the container and each of continuous inwardly concave axial cross section and of substantially circular transverse cross section, the annuli extending peripherally of the sidewall between the opposite end portions, adjacent pairs of annuli affording therebetween a continuous outwardly extending substantially circular ridge positioned in a plane substantially perpendicular to the axis of the container, collapsing of the sidewall of the container being effected by manual axial pressure applied endwise of the container to fold each annulus centrally inwardly of its axial cross section as adjacent annuli fold peripherally about an interposed outwardly extending peripheral ridge to form in each annulus a series of inwardly folded segments and spaced apex portions, each segment of the series extending between adjacent apex portions of the series.

4,324,341

EASILY OPENABLE COVER MEMBER

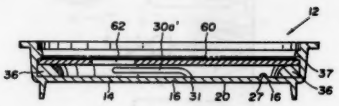
Kisaburo Yamaguchi, Hachioji, and Tsukasa Yoshikawa, Yamato, both of Japan, assignors to Tokan Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 55,909, Jul. 9, 1979, Pat. No. 4,256,239. This application Jun. 18, 1980, Ser. No. 160,590

Claims priority, application Japan, Jul. 26, 1978, 53-101939[U]; Oct. 19, 1978, 53-142787[U]; Oct. 23, 1978, 53-145655[U]

Int. Cl.[3] B65D *51/22*

U.S. Cl. 220—258 5 Claims



1. An easily openable integrally injection-molded cover member for a container comprising a cover sheet formed from synthetic resin of high flexibility and having an integral opening portion defined by a thinned portion on said cover sheet, unsealing means contiguous to at least a portion of said openable portion for removing the openable portion from the cover sheet, whereby when said unsealing means is sheared off said cover sheet, said openable portion is removed from the cover sheet together with the unsealing means, and in which a rigid auxiliary cover disc is detachably fitted in said cover member above the upper surface of said cover sheet of the cover member having the openable portion in a spaced relationship to the cover sheet and said cover disc has a through hole therein for removing the openable portion.

4,324,342

EASILY OPENABLE COVER MEMBER

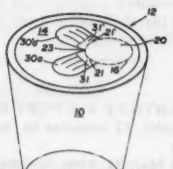
Kisaburo Yamaguchi, Hachioji, and Tsukasa Yoshikawa, Yamato, both of Japan, assignors to Tokan Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 55,909, Jul. 9, 1979, Pat. No. 4,256,239. This application Jun. 18, 1980, Ser. No. 160,591

Claims priority, application Japan, Jul. 26, 1978, 53-101939; Oct. 19, 1978, 53-142787; Oct. 23, 1978, 53-145655

Int. Cl.[3] B65D *17/32*

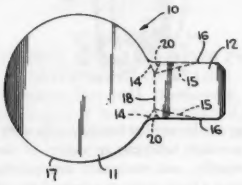
U.S. Cl. 220—268 4 Claims



1. An easily openable integrally injection-molded cover member for a container which cover member includes a cover sheet formed from synthetic resin of high flexibility and having an integral openable portion defined by a thinned portion on

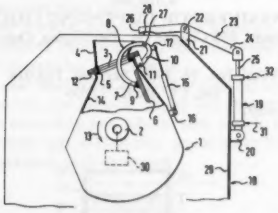
said cover sheet and rigid unsealing means for removing the openable portion from the cover sheet,
characterized in that said unsealing means does not provide a portion overlapping said cover sheet and characterized in that the total surface areas of the openable portion and the unsealing means are substantially equal to the surface area of said cover sheet.

4,324,343
FOLDED TAB
Jens L. Moller, Darien, Ill., assignor to The Continental Group, Inc., Stamford, Conn.
Filed Oct. 16, 1980, Ser. No. 197,720
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 **2 Claims**



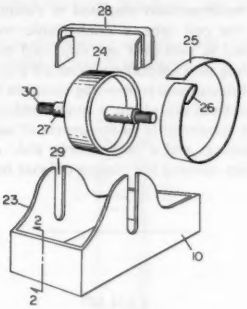
1. A closure tab comprising a body portion for overlying a container panel and closing an opening in the container panel, and a grip portion extending from said body portion, said grip portion being folded into overlying relation to said body portion, said closure tabs being characterized by fold lines primarily in said grip portion defining an inwardly directed folded gusset at each side of said grip portion at and adjacent to said body portion, said gussets defining a fold line between said grip portion and said body portion of a length materially less than the width of said grip portion, said tab being particularly adapted for overlying a circular end panel of a container end unit with said body portion being circular, said fold lines defining said gussets including fold lines extending substantially tangential to the periphery of said body portion.

4,324,344
ROTATABLE PRESSURE VESSEL
Paul Kunz, D-5419 Döttesfeld, Fed. Rep. of Germany
Filed Nov. 5, 1980, Ser. No. 203,560
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947345; Jun. 13, 1980, 3022245
Int. Cl.³ B65D *43/14*
U.S. Cl. 220—333 **13 Claims**



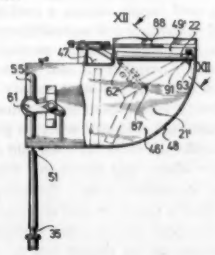
1. A rotatably mounted pressure vessel comprising a feed opening, a cover within said vessel, said cover being movable within said vessel between first and second positions in which, respectively, it closes and opens said opening, a lever movably supporting said cover, a pivot for the lever on the outside of the vessel such that when the cover is in said second position the lever extends into said vessel, a stationary support adjacent said vessel and, mounted on said support, an actuating element to move said cover to said first position to close said opening.

4,324,345
DISPENSER FOR AUTOMATICALLY DISPENSING PERMANENT WAVE TISSUE SHEETS
Manuel M. Martinez, 2105 Park Ave., San Jose, Calif. 95126
Filed Mar. 7, 1980, Ser. No. 128,163
Int. Cl.³ B65H *3/06*
U.S. Cl. 221—41 **12 Claims**



1. A rectangular container, open at the top and adapted to hold a stack of flat tissue sheets, each edge aligned with a pair of parallel edges, said container having four vertical walls, forward and aft walls identifying the long rectangular portion and determining the stack depth of said container with the two side walls providing vertical cutouts,
A single adhesive friction driving roll with its shaft guided on said cutouts positioned parallel to said sheet stack,
A sheet stop with legs thereof guided on said cutouts mounted parallel above said driving roll,
An adhesive paper attached to the periphery of said driving roll,
A knob connected on said driving roll shaft ends,
A serving port located between the forward wall and sheet stop,
Said driving roll and sheet stop further comprising a premeasured weight press.

4,324,346
DEVICE FOR THE TRANSFER OF A COIL TUBE
Kamp Heinz, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany
Filed Mar. 14, 1980, Ser. No. 130,214
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910091
Int. Cl.³ B23Q *7/08*
U.S. Cl. 221—171 **6 Claims**



1. Device for the controlled transfer of a coil tube from a coil

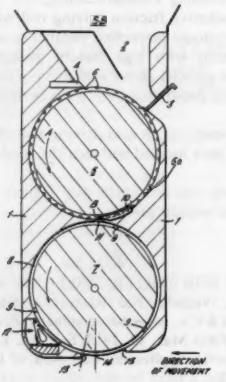
supplying device to a pickup device, comprising a chute, means for applying underpressure to a large area of the long side of the coil tube to transport the coil tube through said chute, said chute having an inner cross-sectional area with a length and a width which are greater than the respective length and width of the coil tube, said chute having narrow sides which are curved through an angle of substantially 90°, and said chute having an upper end with an at least substantially horizontal inlet opening formed therein and a lower end with an outlet opening formed therein, said underpressure applying means including a suction nozzle controllably acted upon by the underpressure disposed in vicinity of said outlet opening for the coil tube, a controllable coil tube feeding device disposed at said inlet opening, said coil tube feeding device including two supporting elements projecting into said chute, at least one of said supporting elements being controllably retractable from said chute, a controllable stop for the coil tube disposed substantially in the center of said chute below said inlet opening, and a controllable slide disposed partly above said inlet opening for closing off said inlet opening.

4,324,347

SEED DRILL APPARATUS

David W. Thomas, Fraithwen, Tregynon, Newtown, Powys, Wales (SY16 3EW)

Filed Aug. 6, 1980, Ser. No. 175,874
Int. Cl.³ A01C 7/04
U.S. Cl. 221—237 **12 Claims**



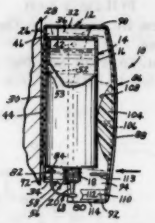
1. A seed drill apparatus comprising an inlet manifold for connection with a seed supply means; a seed collector wheel rotatably mounted in a casing and including a plurality of seed receiving cavities in spaced location around the periphery thereof, a portion of the periphery of said collector wheel lying adjacent said manifold whereby each cavity may receive a seed; a seed distributor wheel rotatably mounted in said casing adjacent and beneath said collector wheel, a gap in the casing defining a seed transfer aperture between said collector wheel and said distributor wheel, said distributor wheel including a peripheral groove to receive a seed dropping through said transfer aperture from a cavity in said collector wheel and to transfer said seed to a seed release outlet beneath said distributor wheel, the groove having therein one or more abutment stops; seed retardation means being located in the casing operatively engaging said groove to bring a seed into contact with the stop prior to release at the outlet.

4,324,348

DISPENSER FOR DISPENSING LIQUID FROM A REPLACEABLE CONTAINER

Logan Johnson, Edina; Grant Wood, Long Lake, and Jerry Brofft, Minnetonka, all of Minn., assignors to Minnetonka, Inc., Minnetonka, Minn.

Filed Jan. 18, 1980, Ser. No. 113,216
Int. Cl.³ B65D 37/00
U.S. Cl. 222—181 **22 Claims**



1. A dispensing enclosure for holding a flexible walled liquid container in a position wherein an outlet of the container is disposed downwardly, said enclosure comprising:

a housing having a back portion adapted for attachment to a support surface and a front portion;

means for coupling the front portion to the back portion of said housing for movement relative thereto;

means for releasably securing the liquid container in an inverted position on the back position of said housing such that the outlet of the container is disposed downwardly;

a sealing plug adapted for receipt in the outlet of the container;

a spring arm mounted on the back portion of said housing for supporting said sealing plug for movement between a sealing position in the outlet of the container and a dispensing position away from the container outlet, said spring arm normally biasing said plug toward the sealing position;

means mounted on the front portion of said housing for engaging and applying pressure to the container as the front housing portion is moved toward the back portion of said housing; and

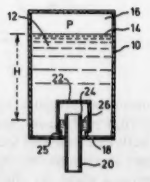
means mounted on the front portion of said housing for engaging said spring arm and for moving said sealing plug to the dispensing position as the front portion is moved toward the back housing portion to thereby dispense liquid from the container.

4,324,349

CONTAINER FOR DISPENSING LIQUID

John G. Kaufman, 858 Condor Dr., Burlington, Ontario, Canada (L7T 3A7)

Filed Jan. 14, 1980, Ser. No. 112,014
Int. Cl.³ B65D 37/00
U.S. Cl. 222—207 **12 Claims**



1. A liquid dispenser comprising:

a squeeze bottle for containing a supply of liquid to be dispensed;

an opening formed in the underside of said squeeze bottle to enable the liquid to be inserted into said squeeze bottle with said squeeze bottle in an inverted upwardly open position; and

a closure for closing said opening;

said closure forming a base for said squeeze bottle and including:

means for sealingly connecting said closure to said squeeze bottle around said bottle opening;

a chamber defining an air pocket in an upper portion thereof;

a liquid passageway connecting a lower portion of said chamber through said bottle opening to the interior of said bottle; and

a liquid outlet connecting said air pocket to the external atmosphere.

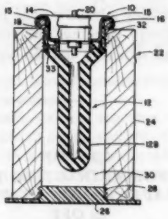
4,324,350
ELASTOMERIC APPARATUS FOR PRESSURE DISPENSING OF FLUID

Kenneth W. Thompson, Box 1455, Bartlesville, Okla. 74003

Continuation-in-part of Ser. No. 898,813, Apr. 24, 1978, abandoned. This application May 16, 1979, Ser. No. 39,497

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—212 **16 Claims**



1. A unitary, self-contained fluid spray dispenser comprising

(a) an elongated tubular expandable unit of selected diameter and length made of expandable elastomeric material of selected composition, a separate substantially rigid tubular neck means molded to an open end of the tubular expandable unit said neck means comprising a thin-walled curved flange at the outer end thereof, and at least one portion of said neck means terminating inside the elastomeric material of the tubular expandable unit;

(b) circular valve support plate means attached to and sealed across the open end of said unit;

(c) spray valve means inserted through and sealed to said valve support plate means;

(d) annular toroidal support ring for sealingly securing the valve support plate means to the thin-walled flange portion of the tubular neck means;

whereby said fluid to be sprayed is inserted under selected pressure into the interior of said unit through said valve, thereby expanding said tubular unit, which, because of its enlargement and its elasticity, continues to hold the liquid under pressure until dispensed.

4,324,351
LOCKING ACTUATOR FOR A DISPENSER

Philip Meshberg, 85 Old Oaks Rd., Fairfield, Conn. 06430

Filed Jul. 29, 1980, Ser. No. 173,340

Int. Cl.³ B65D *83/14*

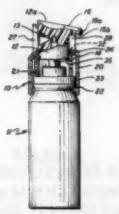
U.S. Cl. 222—402.11 **6 Claims**

1. In an actuator for dispensing material from a container, having means for controlling the dispensing of the material from the container, comprising:

(a) a housing provided with means to be fixedly secured to the container, and a bore extending therethrough;

(b) a dispensing button disposed within said bore and surrounded by the housing, said button being slidably and rotatably mounted within the bore and having a dispensing orifice on one side and located within the bore, an actuating portion for operating the dispensing means in response to inward movement of the button, said button having a control member on the opposite side thereof from said orifice and projecting laterally over the end of said housing and adapted to facilitate rotation of said button, said button being rotated in the housing by said control member between dispensing and nondispensing positions;

(c) stop means on the housing engaging said control member for limiting rotation in said positions;



(d) said housing in the dispensing position having an opening to expose said orifice and in nondispensing position of the button having a wall within the bore adjacent said opening; and

(e) said housing, in the dispensing position of the button, having means to receive the control member to enable the button to be moved inwardly to dispense material and in the nondispensing position having an end wall disposed under the control member to prevent dispensing, the improvement comprising:

(f) an inwardly extending lip formed on the inward edge of said control member, said lip being in abutting relationship with the stop means on said housing when in said dispensing position, for limiting rotation to the dispensing position, to prevent said control means from overriding said stop; and

(g) said means to receive the control member having formed therein a recess for receiving said extended lip.

4,324,352
TAMPER-PROOF HANGER

Charles Goldfarb, 8 rue du Commandant Riviere, Paris 8eme, and Claude Iglitzki, 32 rue Manin a, Paris 19eme, both of France

Filed Mar. 5, 1980, Ser. No. 127,505

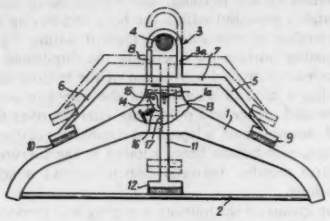
Claims priority, application France, Mar. 29, 1979, 79 07901

Int. Cl.³ A47J *51/14*

U.S. Cl. 223—91 **5 Claims**

1. A tamper-proof hanger comprising an inverted V-shaped yoke formed of a pair of converging arms with shoulder portions at each end thereof; an horizontal cross-member below said arms and interconnecting said arms; at least one downwardly tapering elongated member associated with one of said shoulder portions; said member being connected to a central part; a vertical member movably mounted in said yoke and having a lower end adapted to move in and out of contact with said cross member; said vertical member having an upper end associated with said central part; a hook extending upwardly from said central part; an upstanding rod extending from said yoke and passing through said central part; said rod having an upper end cooperating with said hook to surround support means for said hanger; lock means in said yoke for locking said elongated member in engagement with a garment against said

shoulder portions, with said lower end of said vertical member in engagement with another garment against said cross member and with said upper end of said rod in at least close, locking proximity to said hook.

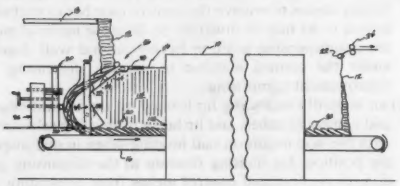


4,324,353

APPARATUS FOR HANDLING TEXTILE FILAMENTARY MATERIAL

Zachry G. Brantley, and Sidney H. Goode, both of Spartanburg, S.C., assignors to Hoechst Fibers Industries, Div. of American Hoechst Corp., Spartanburg, S.C.

Filed Mar. 31, 1980, Ser. No. 135,479
Int. Cl.³ B65H *17/50*
U.S. Cl. 226—118 **7 Claims**



1. A stationary tow inverter for depositing a continuous length of tow onto the surface of a moving conveyor in a plurality of overlapping layers with preceding layers of the tow overlying next succeeding layers in the direction of movement of the conveyor, comprising:

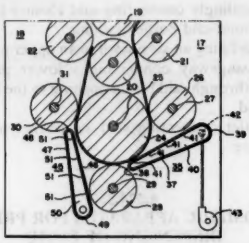
tow guiding means comprising a first stationary guide plate for receiving a continuous length of tow deposited thereon in a plurality of overlapping layers with preceding layers underlying next succeeding layers deposited thereon, a second stationary guide plate spaced from said first plate and cooperating therewith to gravitationally convey and guide the overlapping layers of tow through a downwardly curved passageway to invert the lay of the overlapping layers and deposit the same onto a conveyor surface with preceding layers of tow overlying next succeeding layers in the direction of movement of the conveyor, and support means for adjustably positioning the plates to vary the size of the passageway therebetween to facilitate gravitational guidance and inversion of layers of tow having different dimensional configurations, said support means including means pivotally mounting one of said plates for movement about a horizontal axis to move at least a portion of said one plate away from the other plate in response to a predetermined pressure exerted on said one plate manually or by tow passing through the passageway between the plates.

4,324,354

APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIALS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Jun. 13, 1980, Ser. No. 159,122
Int. Cl.³ B65H *17/22*; G03D *3/08*
U.S. Cl. 226—189 **7 Claims**



1. In apparatus for processing photographic material by conveying an elongated web for turnaround in a confined space comprising

space frame members,

means carried by said spaced frame members for directing the web in an arcuate path,

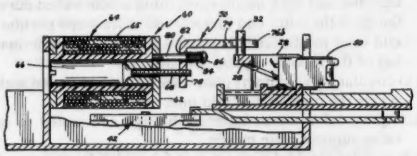
said means comprising a hollow vane having a wall portion with fluid delivery openings therethrough for directing the leading edge of a web and the web in an arcuate path.

4,324,355

MECHANISM FOR RETRACTING THE PRESSURE ROLLERS OF A TAPE TRANSPORT WHEN THE POWER IS OFF

James A. Dust, Minnetonka, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Mar. 21, 1980, Ser. No. 132,383
Int. Cl.³ B65H *17/20*
U.S. Cl. 226—190 **4 Claims**



1. In a tape transport including a pair of capstans, a pair of carrier arms pivotally mounted adjacent one end thereof and each having a pinch roller intermediate said one end and the other end thereof, said pinch rollers being cooperable with said capstans, and respective means independently biasing each carrier arm in a direction so as to cause the pinch roller mounted thereon to move in the direction of the capstan with which it is cooperable, a pinch roller retraction mechanism comprising an upstanding pin at the other end of each of said carrier arms, a T-shaped bar having laterally issuing ears at one end thereof engagable with said upstanding pins when said T-shaped bar is moved in one direction, spring means for moving said T-shaped bar in said one direction, and solenoid means for moving said T-shaped bar in an opposite direction so as to disengage said ears from said upstanding pins whereby either one of said pressure rollers is biased in the direction of the capstan with which it is cooperable.

4,324,356
PROCESS FOR JOINING SILICON NITRIDE BASED CERAMIC BODIES

Howard D. Blair, Romulus, and Morton E. Milberg, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 29, 1979, Ser. No. 25,148
Int. Cl.³ B23K *31/00, 35/24, 35/38*
U.S. Cl. 228—193 **14 Claims**

1. A method of joining silicon nitride based bodies, comprising:

(a) providing separately shaped bodies of silicon nitride based materials, either one or both of such bodies being formed by at least one mode selected from the group comprising pressureless sintering, reaction sintering and hot pressing, each of said bodies having a mating surface along which they are to be bonded.

(b) applying to at least one of said surfaces a film of metallic aluminum based material,

(c) assembling said shaped bodies together with the mating surfaces juxtaposed and in contact with said film of aluminum based material intervening, said mating surfaces and metallic aluminum based material carrying surface oxide, and

(d) while maintaining said surfaces in contact with said film, heating said assembly in a reactive nitriding atmosphere for a period of at least 0.5 hour at a temperature between 1400° C. and 1900° C. to effect an atomic displacement chemical bond between said silicon nitride based materials, metallic aluminum based material, surface oxide and nitriding atmosphere.

11. A method of joining surfaces of silicon nitride based bodies, comprising:

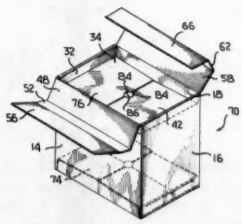
(a) vapor depositing a film of metallic aluminum onto at least one surface to be joined,

(b) while urging said surfaces together with tight contact, heating said bodies to a temperature of about 1600° C. for about one hour in a nitriding atmosphere to effect a Si—Al—O—N system bond therebetween.

4,324,357
CARTON WITH AIR CUSHION END STRUCTURE

Rita J. Murkowski, Columbia, S.C., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,963
Int. Cl.³ B65D *5/08, 81/04*
U.S. Cl. 229—37 E **2 Claims**

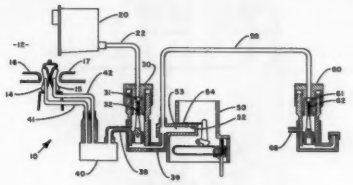


1. A carton end structure comprising a carton body including first and second pairs of side members, first end wall members carried by said first side members and recessed within said carton body and forming an inner end wall, second end wall members carried by said second side members and forming an outer end wall, said outer end wall being spaced from said inner end wall with there being an air cushion space between said inner and outer end walls, and spacer means between said inner wall and said outer wall for maintaining said inner and outer walls in said spaced relation, said spacer means being carried by said second end wall members and including a spacer panel carried by each second end wall member remote from said second side members, said spacer panels being arranged in side-by-side relation and being generally normal to said first and second end walls, and support panels carried by said spacer panels and bearing against said inner end wall.

4,324,358
MINIMUM AIRFLOW CONTROL

David Tulowiecki, Liverpool, and Richard R. Lavassaur, Oneida, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,456
Int. Cl.³ F24F *7/06*
U.S. Cl. 236—49 **2 Claims**



1. A minimum airflow control for an air distribution unit comprising:

bellows controlled damper means for controlling the flow of conditioned air into an area;

first regulator means opening at a first pressure to supply control air to said bellows to cause said bellows to inflate in accordance with the pressure of said control air;

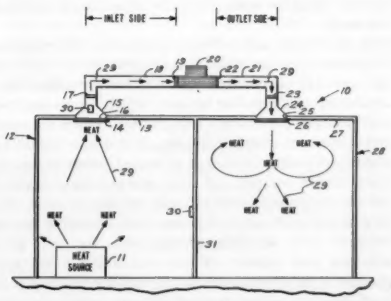
thermostatic means for controlling the pressure of said control air supplied to said bellows by said first regulator means over a first pressure range by bleeding said control air to atmosphere in response to the setting of said thermostatic means to thereby control the inflation of said bellows; and

second regulator means opening at a second pressure which is higher than said first pressure for controlling the pressure of said control air supplied to said bellows by said first regulator means over a second pressure range by bleeding said control air to atmosphere whereby said bellows are inflated so as to provide a minimum flow of conditioned air independent of said thermostatic means.

4,324,359
HEAT RECLAIMING SYSTEM

Wayne O. Bannister, 1502 Nance St., Newberry, S.C. 29108

Filed Jul. 28, 1980, Ser. No. 173,096
Int. Cl.³ F24F *7/00*
U.S. Cl. 237—46 **1 Claim**



1. A heat reclaiming system, comprising, in combination, an inlet vent covered by a grill, and secured in a ceiling opening

of a first room having a heat source; an inlet duct secured by a clamp to said inlet vent, said inlet duct being connected by a clamp to an inlet side of a blower; an outlet duct secured by a clamp to an outlet side of said blower, said outlet duct being connected by a clamp to an outlet vent covered by a grill, and located in a ceiling opening of a second room having need of more heat therein; whereby heated air adjacent the ceiling of said first room is reclaimed to said second room, both said vents, both said ducts and said blower being located at an elevation above both said ceilings; and a thermostat activating said blower being located on a wall of said first room.

4,324,360

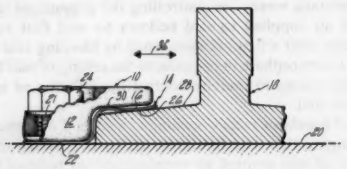
ELEVATOR GUIDE RAIL MOUNTING ARRANGEMENT

Lu Sun, and Janis J. Cilderman, both of Simsbury, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 19,199, Mar. 9, 1979, abandoned. This application Jan. 30, 1981, Ser. No. 229,914

Int. Cl.³ E01B *9/00*

U.S. Cl. 238—349 **2 Claims**



2. A rail clip apparatus for attachment at spaced apart points on a wall for holding a rail in position on the wall, the apparatus including a spacer for applying hold-down force to the rail surface and a retainer which holds the spacer on the wall, characterized in that:

the retainer is rigid and L-shaped, having a main body section and an arm-like section, said arm-like section for extending over a portion of the rail surface in a spaced relationship with the rail surface so as to restrain rail movement within a prescribed distance from said wall, and said main body section for restricting movement of the rail along the wall, when the apparatus is attached to the wall,

the spacer is constructed of springy steel and is Z-shaped and includes a concave portion, the concavity of which faces said arm-like section and which is forced against the rail surface by said arm-like section, which forces one end of said concave portion towards the wall when the retainer and spacer are attached thereto, said spacer including an additional portion which is squeezed between said main body section and the wall when the apparatus is attached thereto, and the balance of said concave portion, beginning at said one end, being free to move within the space between said arm-like section and the rail surface, whereby said balance of said concave portion applies resilient hold-down force to the rail for holding it resiliently in place against the wall while permitting it to move within the space between said arm-like section and the wall, and said arm-like section limits the travel of said concave portion and the rail away from the wall.

4,324,361

METHOD OF ATOMIZATION AND ATOMIZING DEVICE FOR COATING MATERIAL USING THE COANDA EFFECT

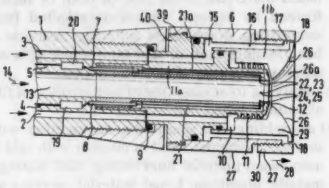
Kurt Moos, Wil, and Karl Buschor, St. Gallen, both of Switzerland, assignors to GEMA AG Apparatebau, Switzerland

Filed Nov. 29, 1979, Ser. No. 98,345

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852412; Jun. 9, 1979, 2923451

Int. Cl.³ B05B *5/00, 7/00, 7/10*

U.S. Cl. 239—3 **28 Claims**



1. A method for atomizing a material, comprising the steps of:

providing a stream of a material to be atomized flowing in a first direction;

injecting into the stream an atomizer gas in a direction generally across said first direction; and

moving the stream through a progressively enlarging annulus having an interior surface so curved that the stream will flow along the contour of said interior surface without reverse eddies and without substantial turbulence; said injecting and moving steps being performed in such a manner as to cause the stream, the injected atomizer gas and said interior surface to cooperate to cause the stream to expand into a broader stream of atomized material.

4,324,362

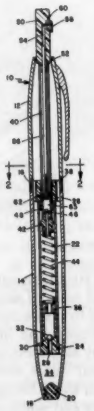
POCKET ATOMIZER

Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Pocket Supportable Atomizer Device Trust

Filed Mar. 6, 1979, Ser. No. 127,903

Int. Cl.³ B05B *1/00*

U.S. Cl. 239—211 **7 Claims**



1. A pocket atomizer having an elongated barrel which forms a reservoir, a pump cylinder within said reservoir, a first check valve coupling the bottom of said pump cylinder to said reservoir, a hollow piston having a hollow piston rod, which

piston is axially movable up and down within said pump cylinder to force liquid up the interior of said hollow piston rod, a second check valve within the lower end of said hollow piston rod, and an orifice in the upper end of said hollow piston rod for discharging the pumped liquid, characterized by

a capillary tube within the interior of said hollow piston rod having an upper end coupled to said orifice for preventing liquid from draining therefrom between uses and thereby eliminating the necessity of priming the atomizer between uses, wherein the lower end of said capillary tube terminates some distance above said second check valve to define a chamber above said second check valve; and

means sealing the space between the interior of said hollow piston rod and said capillary tube so that liquid flows only through said capillary tube when pumped up through said second check value;

wherein the second check valve includes a valve seat and a ball of greater diameter than said capillary tube and of sufficient mass to seat in said valve seat when said piston is moved up; and

wherein said chamber is of sufficient diameter and depth to enable said ball to move up off of said valve seat to enable liquid to be pumped up through said second check valve and into said capillary tube when said piston is moved down.

4,324,363

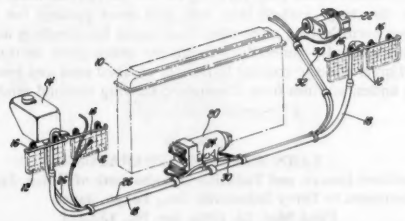
HEADLAMP WASHER ASSEMBLY HAVING A MULTIPORTED FLOW VALVE

John T. Rauen, Jr., Troy, Mich., assignor to C-D Marketing Ltd., Ann Arbor, Mich.

Continuation of Ser. No. 941,368, Sep. 11, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,191

Int. Cl.³ B60S *1/56, 1/50*

U.S. Cl. 239—284 A **14 Claims**



1. A fluid dispensing assembly comprising: liquid storage means for storing liquid; gas storage means for storing a predetermined volume of gas; a gas source for charging said gas storage means; dispensing means for containing a predetermined quantity of dispensing liquid and for dispensing the liquid over a predetermined area; valve means in fluid communication with said liquid storage means, said gas storage means, said gas source and said dispensing means for charging said gas storage means from said gas source while simultaneously charging said dispensing means with said dispensing liquid from said liquid storage means when in a first position and for discontinuing said charging of said gas storage means and said dispensing means while simultaneously subjecting said dispensing means to gas from said gas storage means to force said dispensing liquid through said dispensing means when in a second position.

4,324,364

ADJUSTABLE SHOWER HEAD

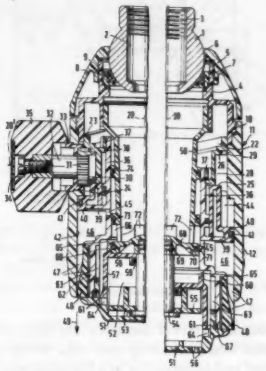
Günther Buzzi, and Magdalena Faisst, both of Schiltach, Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,378

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2911936

Int. Cl.³ B05B *1/06, 1/08*

U.S. Cl. 239—383 **14 Claims**



1. An adjustable shower head for producing adjustable sprays comprising:

a housing having a major axis and at least one inner cylindrical guide surface;

a liquid supply connection connected to said housing for the input of liquid to said housing;

a slide bushing mounted for rotation on said inner cylindrical guide surface and for axial movement in said housing along said major axis, said slide bushing having an inclined slot defined on an outer cylindrical surface thereof, said slide bushing having a toothed rim thereon extending along a portion of said slot;

a stub shaft rotatably mounted on said housing extending radially of said housing and carrying a pinion engaged with said toothed rim for rotation of said slide bushing with rotation of said pinion;

a handle member connected to said stub shaft and extending out of said housing for rotation of said pinion;

a guide pin coaxially connected to said pinion and guided in a flushed fashion in said inclined slot for axial movement of said bushing with rotation of said pinion; and

at least one spray element fixed to said slide bushing for movement thereof and to define a variable nozzle opening with at least a portion of said housing to produce an output spray of the liquid which is adjustable with axial movement of said slide bushing in said housing which movement varies said variable nozzle opening, and flow path means connected between the liquid supply connection and said variable nozzle opening.

4,324,365

NEBULIZER

Harry Howarth, Mount Waverley, Australia, assignor to Varian Techtron Pty. Ltd., Victoria, Australia

Filed Oct. 31, 1979, Ser. No. 89,819

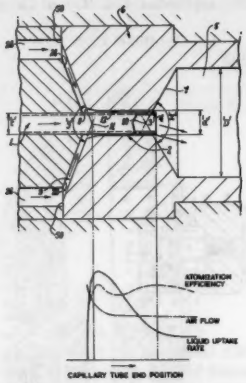
Claims priority, application Australia, Nov. 6, 1978, PD6655

Int. Cl.³ B05B *7/06*

U.S. Cl. 239—424 **7 Claims**

1. A nebulizer including venturi means, a cylindrical throat and a cylindrical chamber each forming part of said venturi means and being arranged in substantially coaxial end to end communication, the diameter of said chamber being larger

than the diameter of said throat, said throat having an inlet end remote from said chamber and an outlet end adjacent said chamber, said throat outlet end being at an end surface of said chamber, said end surface being frusto-conical and having an included angle within the range 110° to 130° inclusive, a liquid



feed tube having an external diameter less than the diameter of said throat, said tube extending into said throat through said inlet and thereof and terminating at a location remote from said inlet end, and air feed passage means external of said tube and communicating with said throat inlet end.

4,324,366

CONTROL SYSTEM FOR REGULATING A SPRAY GUN PAINT PRESSURE

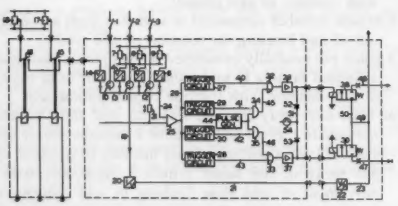
Georg Geier, and Manfred Löhne, both of Hanover, Fed. Rep. of Germany, assignors to WABCO Steuerungstechnik, Hanover, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,333

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924264

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—533.1 **7 Claims**



1. A control system for automatically regulating the amount of paint emitted by a spray gun, said control system comprising:

(a) a consumer line connected to said spray gun;

(b) control valve means for varying the pressure in said consumer line and accordingly the desired amount of paint to be emitted by said spray gun;

(c) a control circuit including a differential amplifier having first and second inputs and an output providing a polarity signal when a voltage potential exists across said first and second inputs to operate said control valve means depending upon the sense of said polarity signal;

(d) means for providing a control signal representative of the ideal pressure of said consumer line including a collection line connected to said first input of said differential amplifier, said collection line having an electric current corresponding to said control signal;

(e) first transducer means connected to said consumer line for providing a voltage signal representative of the actual pressure of said consumer line;

(f) second transducer means connected between said first transducer means and said collection line for conducting the flow of electric current therefrom in accordance with said voltage signal;

(g) a reference potential line connected to said second input of said differential amplifier; and

(h) a resistor connected between said collection line and said reference potential line via which current in said collection line flows when the current thereof deviates from the current of said second transducer to thereby establish said voltage potential across said first and second inputs of said differential amplifier.

4,324,367

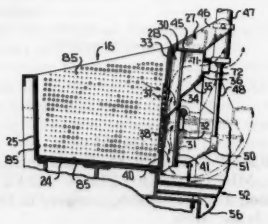
SAND LUMP CRUSHING DEVICE

Joseph E. Bowling, Waynesboro, Pa.; James H. Carpenter, and Russell L. Rowe, both of Hagerstown, Md., assignors to Kennecott Corporation, Stamford, Conn.

Filed Oct. 31, 1979, Ser. No. 90,028

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—60 **15 Claims**



1. In a sand lump crusher an active end wall arrangement comprising inner and outer walls disposed in spaced relation and defining a vertical inner passage of restricted width, a perforated crusher plate forming a lower part of said inner wall and directing crushed sand into said inner passage for free downward flowing movement, and means for directing an air wash upwardly generally through the entire cross section of said inner passage counter to flow of crushed sand and removing undesired fines from downward flowing crushed sand.

4,324,368

YARN WINDING APPARATUS

Yoshinori Inouye, and Tadahiko Ohkubo, both of Ootsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 13, 1980, Ser. No. 130,114

Claims priority, application Japan, Mar. 15, 1979, 54-30436

Int. Cl.³ B65H *54/02, 54/34*

U.S. Cl. 242—18 PW **16 Claims**

1. An apparatus for winding a yarn on a bobbin comprising:

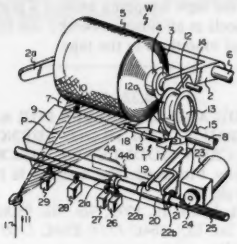
a guide for serving as a fulcrum of the traverse motion of a yarn;

a mechanism for positively driving and holding said bobbin;

a traverse mechanism interposed between said bobbin and said fulcrum guide further comprising a traverse guide having a narrow opening and a wide yarn holding portion through which said yarn may travel and reciprocating means for traversing said traverse guide along the direction of the generatrix of said bobbin so as to form a yarn package on said bobbin, said yarn moving to and fro in accordance with said traverse guide forming a path between said fulcrum guide and said bobbin;

a yarn catching guide substantially parallel the moving di-

rection of said traverse guide and substantially perpendicular to the plane of said yarn path, adjacent said traverse guide and movable along the moving direction of said traverse guide, having an inclined portion proximate said yarn path and having a hook portion adjacent said inclined portion for catching said yarn, said inclined portion positioned to intersect said yarn path, and said hook portion projecting away from said yarn path and being positioned more distant from the plane of said yarn path than said opening of said traverse guide.



4,324,369

DOUBLE DRUM WINDER

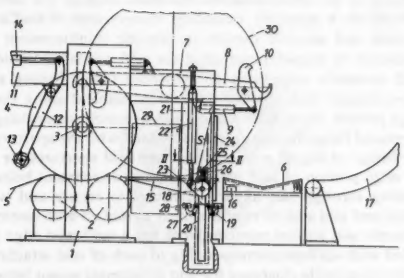
Bernhard Bartmann, Heindenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,954

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928543

Int. Cl.³ B65H *17/08*

U.S. Cl. 242—66 **20 Claims**



1. A double-drum winder for winding a roll of web material and for ejecting a wound roll of web material, the winder comprising:

drums for being driven to rotate and on which a roll of web material is to be wound;

a transfer table positioned next to the drums and to which a wound roll is to be transferred;

ejecting means for ejecting a wound roll off the drums and for moving the wound roll onto the transfer table;

the transfer table being pivotally mounted on a pivot axis, which is generally parallel to the axis of the wound roll, whereby the transfer table can be pivoted between a horizontal position at which the transfer table is positioned to receive an ejected roll, and a vertical position at which the transfer table serves as a protective shield against movement of a roll past the vertical transfer table.

4,324,370

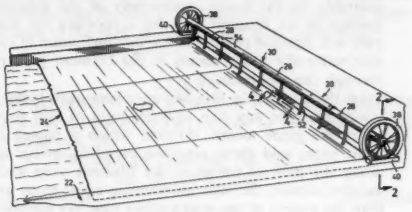
POOL COVER ROLLER ASSEMBLY

Wayne Guard, and Tibor Feher, both of Milton, Canada, assignors to Feherguard Products, Milton, Canada

Filed Nov. 6, 1980, Ser. No. 204,408

Int. Cl.³ B65H *17/46*

U.S. Cl. 242—86.52 **20 Claims**



1. An apparatus adapted to be rested on a surface adjacent to a pool for use in removing and storing a swimming pool cover and the like, comprising:

a telescoping roller member having a first tubular section and two second tubular sections, each section having inside and outside diameter walls, said second tubular sections adapted to be telescopically disposed one from each end of said first tubular section to provide first and second roller ends, said first tubular section further defining a plurality of uniformly spaced ribs disposed from its inner diameter wall and extending longitudinally of the section from end to end thereof, said second tubular sections further defining a plurality of similarly spaced ribs disposed from their outer diameter walls, and extending longitudinally of each section from end to end thereof, the said inner wall ribs of said first tubular section engaging upon the said outer wall ribs of said second member when the said ribs of each section are aligned radially, thereby fixing said sections relative to each other;

support means for mounting the first and second ends of the roller for rotational movement of the roller above the surface on which the apparatus is to be rested such that the pool cover can be wound onto the roller;

means for securing an edge portion of the pool cover to the roller; and,

means for use in rotating said roller for winding up and unwinding said pool cover.

4,324,371

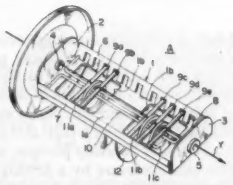
APPARATUS FOR CONTROLLING TENSION OF FILAMENT YARN

Hichio Shimizu, Fukui, Japan, assignor to Oda Gosen Kogyo Kabushiki Kaisha, Komatsu, Japan, a part interest

Filed Nov. 3, 1980, Ser. No. 203,149

Int. Cl.³ B65H *59/26, 59/36*

U.S. Cl. 242—153 **5 Claims**



1. An apparatus for controlling the tension of a filament yarn, provided between a pirn of the filament yarn and a take-up especially in a warping machine to allow the filament yarn to start its run and to continue its run with substantially the

same required minimum tension as that which the filament yarn has during its rest state, comprising:

a generally oblong frame;

an inlet guide and an outlet guide provided at longitudinally opposed ends of said frame, through which a running filament yarn is introduced in and discharged out from said apparatus during a warping operation,

a plurality of rotatable roller-like guide means provided rotatably on the frame transversely of the direction of passage of the filament yarn for supporting the filament yarn at a topmost portion of the circumference of each of said roller-like guide means as the filament yarn passes through the apparatus,

at least three movable ring-like members each being positioned between any two adjacent ones of said rotatable roller-like guide means, through which is passed a filament yarn, said three ring-like members being spaced along the path of travel of the filament yarn with the member closest the inlet guide being equal to or greater than the weight of the intermediate ring-like member and with said intermediate ring-like member being of greater weight than the ring-like member located closest to said outlet guide of said apparatus, and

a supporting means provided on the frame under said rotatable roller-like guide means to limit the lowest position of said movable ring-like members as the running filament yarn comes to a halt,

said lowest position of said ring-like members being defined by that topmost portion of the inner circumference of each ring-like member which is lower than the topmost portions of the circumferences of the rotatable roller-like guide means,

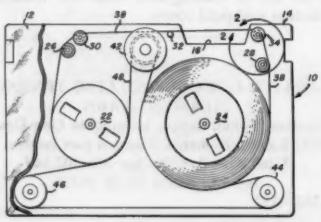
the topmost portion of the circumferences of the roller-like guide means being aligned in a horizontal plane to allow the filament yarn to pass through the apparatus horizontally and rectilinearly during the warping operation.

4,324,372

HIGH DENSITY BELT DRIVEN DIGITAL DATA TAPE CARTRIDGE

Stepan Majicek, San Jose, and Harry R. Robinson, Santa Clara, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed May 16, 1980, Ser. No. 150,571
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—192 **11 Claims**



1. An improved belt driven tape cartridge including a shell means defining an enclosure having a cutaway portion along one edge, a pair of reel hubs supported for rotation on spaced parallel axes within said enclosure, a length of tape convolutely wound on said reel hubs in opposite directions about the axes of said reel hubs and guided through a path along one edge of said enclosure and across said cutaway portion, and a driving belt supported within said enclosure by a driving roller and a pair of belt guide members defining a belt guide path spaced from said tape path and passing between said reel hubs from said belt driving roller to each of said belt guide members wherein the improvement comprises,

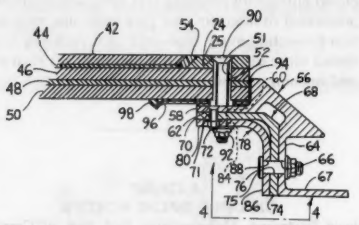
a first and a second flywheel rotatable about a fixed axis, the axes of the flywheels being parallel to the axes of said reel hubs, the first and second flywheel being located on opposite sides of said cutaway portion of said enclosure along said tape guide path, each flywheel situated intermediate one of said reels and said cutaway portion, both of the flywheels being rotatably mounted and positioned so as to intimately contact said tape across the full width of said tape with the tape wrapping around a portion of each of said flywheels at all times, whereby the flywheels absorb longitudinal vibrations in the tape.

4,324,373

METHOD AND APPARATUS FOR ADD-ON REINFORCEMENT FOR TRANSPARENCY SYSTEM FOR CREW MODULE FOR AIRCRAFT

George Zibritosky, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1979, Ser. No. 95,806
Int. Cl.[3] B64C *1/14;* E04C *1/00*
U.S. Cl. 244—121 **6 Claims**



1. A crew module for use in aircraft comprising a windshield and a canopy, said windshield including an aft edge portion, an aft arch assembly comprising an aft arch, an aft arch support and attachment means securing said aft arch to said aft arch support, said aft arch assembly interposed between the aft edge portion of the windshield and the front edge of the canopy, said aft arch assembly extending transversely of said crew module and secured thereto to provide reinforcement and resistance to impact penetration for said windshield, said aft arch assembly comprising an apertured flange having apertures aligned with apertures in said windshield along the aft edge portion thereof, an add-on reinforcement comprising on apertured flange having apertures aligned with the apertures of the flange of the aft arch assembly and said apertures for said aft edge portion of said windshield, and attachment bolts extending through said aligned apertures to secure said windshield and said add-on reinforcement to said aft arch assembly, wherein said add-on reinforcement has a scalloped edge provided with scallops corresponding to each of said attachment means to provide clearance for said attachment means between said aft arch and said aft arch support when said add-on reinforcement is secured to said aft arch, aft arch support and said windshield.

4,324,374

INTEGRATED SPACECRAFT AND CRADLE STRUCTURE

Alois Wittmann, Rancho Palos Verdes, and Charles P. Rubin, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 910,912, May 30, 1978, abandoned.
This application Apr. 15, 1980, Ser. No. 140,555
Int. Cl.[3] B64G *1/14, 1/64*
U.S. Cl. 244—158 R **1 Claim**

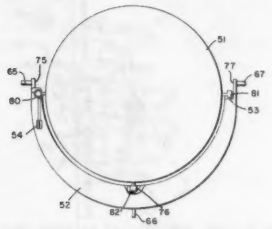
1. An integrated spacecraft and cradle assembly for supporting a spacecraft in the payload bay of a space shuttle comprising:

a generally U-shaped cradle of a light and thin construction

having two end portions and an intermediate section between said end portions;

three trunnions projecting outwardly from said cradle, for mounting to the payload bay of the space shuttle, one at each of said end portions of the cradle and the third at said intermediate section;

means providing three attachment points for a spacecraft within said cradle, one at each of said end portions and the third at said intermediate section;



a spacecraft having three spacecraft trunnions around the periphery thereof, each pivotally engaging a corresponding one of said three attachment points of said cradle; and

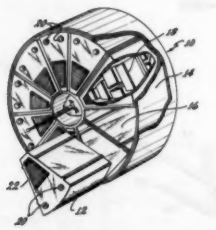
a spacecraft truss frame structure interconnecting said spacecraft trunnions which provides a structural tie between said two end portions of said U-shaped cradle and said intermediate section to stiffen said cradle, said spacecraft truss frame structure also supporting major components mounted within said spacecraft.

4,324,375

HEAT SINK/FLUID-TO-FLUID MECHANICAL COUPLING OF SPACECRAFT COOLANT SYSTEMS

Richard F. O'Neill, Carlsbad, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Dec. 26, 1979, Ser. No. 106,934
Int. Cl.[3] B64G *1/50*; G05D *23/00*
U.S. Cl. 244—163 **15 Claims**



1. In a separable system having a first cooling system which contains heat generating elements adapted to couple with a second fluid circulating cooling system, the improvement comprising,

means in said first system for dissipating heat from the heat generating elements,

said heat dissipating means having means for selectively coupling to said second system in a direct mechanical connection when positioned adjacent thereto and uncoupling for removing said mechanical connection for remote positioning thereof in response to the pressure of the fluid in one of said systems.

14. A spacecraft for oribiting in a geosynchronous corridor and containing a plurality of individual self contained modules for the functioning of said satellite, said device having tubing containing fluid coolant as part of a cooling system which receives heat generated by said modules and transfers said heat to a radiator in said device so as to return cooler fluid to said modules,

means for pressurizing and moving the fluid in said tubing, said cooling system containing a plurality of subsystems one for each of said modules in said device,

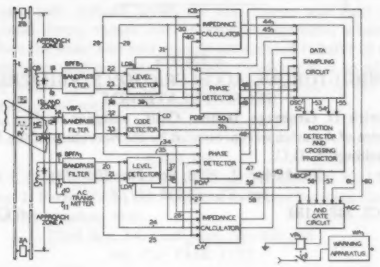
each subsystem having means for coupling said tubing to said module in response to pressure in said cooling system and means for isolating each subsystem from other subsystems to permit depressurization of said subsystem and thus decouple said module from said subsystem without interference in the flow of fluid in said other subsystems.

4,324,376

RAILROAD HIGHWAY CROSSING WARNING SYSTEM

John J. Kuhn, Allison Park, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Jun. 24, 1980, Ser. No. 162,471
Int. Cl.[3] B61L *1/02*
U.S. Cl. 246—125 **11 Claims**



1. A railroad highway crossing warning system comprising, means for sensing current flowing in the track rails of an approach zone, means for sensing the voltage across the track rails, means connected to said current and voltage sensing means for filtering the voltage and current derived from the track rails, means connected to said filtering means for calculating the track impedance, means connected to said filtering means for detecting the phase angle between the voltage and current, means connected to said impedance and phase angle means for linearizing the calculated track impedance by multiplying the track impedance by a function of the phase angle, means connected to said voltage filtering means for detecting coded signals in the track rails, means connected to said linearizing and coded detecting means for sampling the linearized track impedance at given periodic intervals, means connected to said sampling means for detecting the motion of a train and for predicting the time of arrival at the crossing by comparing the predicted time of arrival at the crossing with an advance warning time, and means connected to said motion detecting and predicting means for activating the warning apparatus at the crossing when the predicted time of arrival is less than the advance warning time.

4,324,377

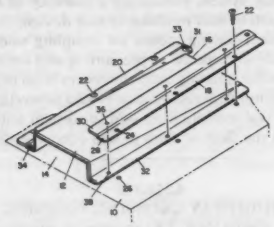
SAFETY KNIFE HOLDER

Allan P. Jones, 7340 Amestoy, Van Nuys, Calif. 91406, and Patrick L. Reichstein, 44808 Lorimer Ave., Lancaster, Calif. 93534

Filed Nov. 13, 1979, Ser. No. 93,302
Int. Cl.[3] A47G *21/14*
U.S. Cl. 248—37.6 **1 Claim**

1. A safety knife holder comprising an elongated body portion, said body portion slanting from a raised open end to a narrow closed end, adapted to frictionally receive and hold the blade end of a knife, rail holders fixedly attached to a table to slidably receive said body portion, flanges at each side of said

body portion, in which one side of said rail holders is securable to a table and the other side is slightly raised for receiving of



said flanges, in which said rail holders have pips adapted to match pips on the flanges for positioning of the body portion, a raised lip at the open end of said body portion.

4,324,378

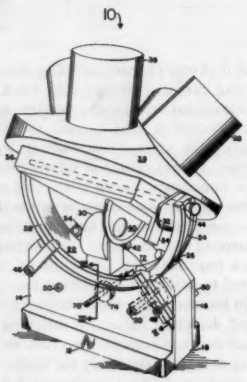
HIGH-TORQUE/ACCELERATION STABILIZED SENSOR PLATFORM

Frederick D. Groutage, Bonita, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1980, Ser. No. 126,778

Int. Cl.³ F16M *11/12*

U.S. Cl. 248—184 **6 Claims**



1. A gimbal high torque/acceleration stabilized platform comprising:

a selectively positionable member for securing a load to said stabilized platform;

an inner gimbal gear drive mechanically connected to said selectively positionable member for imparting a first degree of freedom to said selectively positionable member;

a pivot rod operatively engaged with said selectively positionable member for permitting said selectively positionable member to rotate about said pivot rod;

an outer gimbal ring operatively coupled to said pivot rod for imparting a second degree of freedom to said selectively positionable member;

a cradle assembly for providing a base for and for engaging said outer gimbal ring; and

a torque motor secured in fixed relation to said outer gimbal ring and mechanically coupled to said inner gimbal gear drive.

4,324,379

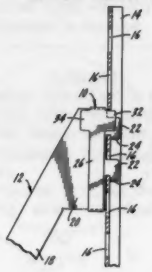
DISPLAY SHELF LOCK

Ernest Ovitz, III, Galva, Ill., assignor to John H. Best & Sons, Inc., Galva, Ill.

Filed Jan. 10, 1980, Ser. No. 111,117

Int. Cl.³ E04G *5/06*; F16L *3/06*; F21L *15/08*

U.S. Cl. 248—222.1 **7 Claims**



1. In a shelf support bracket releasably attached to an upright support wherein the bracket has an arm terminating at a body portion with at least one hook extending therefrom to engage a slot in the upright support, the improvement comprising a lock for preventing inadvertent removal of the bracket hook from the support slot, the lock having first and second attachment clips which are slidably engageable with the body portion of the bracket such that the lock can be mounted on either side of the body portion and the lock having an ear which projects into a slot in the upright support, adjacent the top edge of the slot to prevent lifting of the bracket.

4,324,380

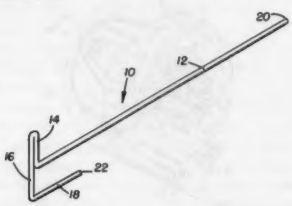
MOUNTING PIN

Bruce J. Rothenberg, 200 B Rutledge St., San Francisco, Calif. 94110

Filed Feb. 4, 1980, Ser. No. 118,449

Int. Cl.³ A47H *1/16*

U.S. Cl. 248—302 **8 Claims**



1. A mounting pin, comprising

(a) a straight long run,

(b) a straight short run extending perpendicular from said long run

(c) a straight inner run extending 180° from said short run and in touching relationship thereto, and

(d) a straight run extending perpendicular from said inner run.

4,324,381

BEVERAGE CONTAINER SUPPORT

Stephen Morris, 399 Fullerton, Apt. 15E, Chicago, Ill. 60614

Filed Jan. 16, 1980, Ser. No. 112,696

Int. Cl.³ A47K *1/08*

U.S. Cl. 248—311.2 **5 Claims**

1. A beverage container support comprising a first wire

element formed with a pair of diametrically opposed uprights interconnected at their lower ends by a wire network which lies in a generally horizontal plane and forms the base of a container receiving receptacle, said wire network of said first wire element being formed to include a portion that lies transversely of a line extending between said uprights, said uprights of said first wire element each terminating in a hook, a second wire element forming a plurality of vertically spaced annular

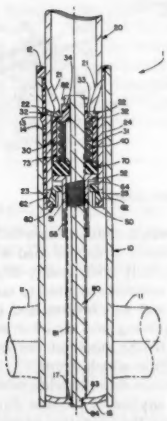
rings secured to said uprights and defining sides of said container receiving receptacle, a third wire element having a pair of spaced arms that terminate with means for supporting the receptacle formed by said first and second wire elements by said first hooks for pivotal movement relative to said third wire element in a first direction of movement, and said third wire element being formed with hanger means from which said support may be hung for pivotal movement in a second direction of movement.

4,324,382

HEIGHT ADJUSTABLE CHAIR BASE

Duane M. Beukema, Grand Rapids, and Jack R. Knoblauch, Byron Center, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 21, 1979, Ser. No. 50,660
Int. Cl.³ A47C 3/24
U.S. Cl. 248—406 **29 Claims**



1. A height adjustable chair base having a hub tube, a seat column telescopically positioned within said hub tube, and being operably carried on a nut which is located within said column and which nut is threaded on an externally threaded post located within said hub tube, in which the improvement comprises: abutment means connected with said column for supporting the same, and being disposed above said nut;

a spring housing slidably mounted on said post, and having an upper surface engaging said abutment means for supporting said seat column thereon, and a lower edge disposed adjacent to said nut;

spring means positioned within said spring housing and extending between said housing and said nut in an abutting relationship with both, whereby said spring housing and said column are biased upwardly relative to said nut;

said nut including first detent means opening toward the underside of said nut;

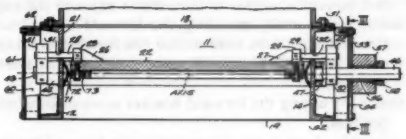
said column extending downwardly outside of said nut to a point below said first detent means on said nut; said column including second detent means located below said first detent means on said nut and shaped for mating engagement therewith; said threaded post being fixed against rotation within said hub tube; said spring means being sufficiently soft that when a chair mounted on said column is occupied by a person, said spring means compresses to diverge said first and second detent means, and converge the lower edge of said spring housing into abutment with said nut for positively supporting the weight of the chair and occupant thereon, but being sufficiently stiff that when the chair is unoccupied, said spring means biases said column upwardly and biases said first and second detent means into locking engagement, whereby when the chair and said column are rotated relative to said hub tube, said nut rotates on said threaded post to adjust the chair upwardly or downwardly depending on the direction of rotation thereof.

4,324,383

SEAT CENTERLINE OPERATED BUTTERFLY VALVE

Anthony J. Ferro, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 11, 1980, Ser. No. 186,290
Int. Cl.³ F16K 1/22
U.S. Cl. 251—308 **2 Claims**



1. A butterfly valve including;

A valve body structure comprising four channel members operatively secured together and defining a passageway therethrough for fluid flow;

a valve vane supported by said valve body for pivotal movement within said passageway;

a valve seat within said passageway and secured to the inner surfaces of said channel members defining a continous seating surface and having a center line;

a seal carried by said vane at the outer edge thereof in position to engage with said seat on the center line thereof to provide bidirectional sealing;

drive means operably connected to effect pivotal movement of said vane to an open position or to a closed position selectively, said drive means having an actuating shaft, extending through and supported for rotation by said one of said channel members, said valve seat center line coinsides with the axis of said drive means;

a lever having one end secured to the inner end of said actuating shaft;

an arcuate slot formed in the wall of said channel member supporting said actuating shaft;

a secondary shaft carried by the opposite end of said lever and extending through said arcuate slot into said passageway;

an abutment secured to a surface of said vane and positioned to receive the end of said secondary shaft that extends into the passageway;

whereby rotation of said actuating shaft will effect the simulta-

neous movement of said connected lever, said secondary shaft, said abutment and, thereby, said vane; and

a compartment formed on the external surface of said channel member through which said drive means extends to enclose said drive means and said arcuate slot to prevent fluid leakage from the valve.

4,324,384

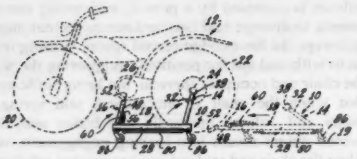
SERVICING STAND FOR THREE WHEELED VEHICLES

Kirby W. Elser, 8501 Rumson Dr., Santee, Calif. 92071

Filed Oct. 29, 1980, Ser. No. 201,031

Int. Cl.³ B66F *3/00*

U.S. Cl. 254—8 B **10 Claims**



1. A servicing stand for a three wheeled vehicle having two rear wheels mounted to opposite ends of an axle powered by an engine and a front wheel, comprising:

a horizontal base;

a rearward bracket having a pair of upper ends for engaging and supporting the axle at spaced apart locations adjacent the rear wheels;

means for pivotally mounting the rearward bracket to the rearward end of the base so that the rearward bracket can swing upwardly from a retracted position to an extended position;

a forward bracket having an upper end adapted to engage and support a portion of the vehicle adjacent the engine;

means for pivotally mounting the forward bracket to the forward end of the base so that the forward bracket can swing upwardly from a retracted position to an extended position;

means for urging the forward bracket towards its extended position;

releasable clamp means for retaining the forward bracket in its retracted position; and

linkage means for connecting the rearward bracket with the clamp means so that movement of the rearward bracket away from its retracted position operates the clamp means to release the forward bracket so that the forward bracket can swing towards its extended position.

4,324,385

DEVICE FOR REMOVING AND DEPOSITING LOADS BETWEEN TWO SUPPORTS IN REPEATED RELATIVE VERTICAL MOVEMENT

Maurice Cojean, Nantes, and Jean-Paul Colin, Saint Sebastien, both of France, assignors to Ateliers et Chantiers de Bretagne ACB, France

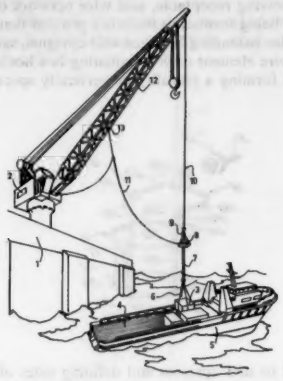
Filed Aug. 30, 1978, Ser. No. 938,247

Claims priority, application France, Aug. 31, 1977, 77 26503

Int. Cl.³ B66D *1/48*

U.S. Cl. 254—270 **12 Claims**

1. Apparatus for transferring a load between relatively vertically moving supports on one of which is a crane having a load lifting cable, said apparatus comprising a frame suspended from said load lifting cable; a vertically extensible and retractable second cable carried by said frame and supporting a hook for fitting to said load; operating means supported wholly by said frame and including rotary winch means coupled to said second cable and drive means for rotating said winch means for vertically extending and retracting the latter to lower and raise said hook an amount at least equal to the amplitude of relative vertical movement of said supports; and means for



disabling said operating means and maintaining said hook in a selected position of vertical adjustment relative to said frame.

4,324,386

BATTENS SYSTEM FOR RAISING AND LOWERING SCENERIES OR SIMILAR LOADS ON A STAGE

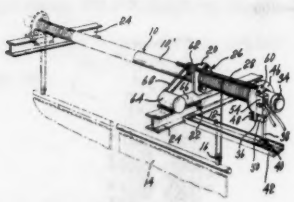
Pierre Gagnon, 5637 Wilderton St., Montreal, Quebec, Canada (H3T 1S1), and Pierre LaForest, 1945 Bruxelles St., Montreal, Quebec, Canada (H1L 5Z5)

Filed May 19, 1980, Ser. No. 151,280

Claims priority, application United Kingdom, Mar. 29, 1980, 10699/80

Int. Cl.³ A63J *1/02*; B66D *1/39, 1/48*

U.S. Cl. 254—288 **16 Claims**



1. A battens system comprising:

(a) a support;

(b) an elongated winch drum upon which at least one cable supporting a scenery or similar load is wound, said winch drum being generally horizontally disposed;

(c) bearing means assembly secured to said support for rotatably mounting said winch drum and including means for longitudinally moving said winch drum at each turn by a distance equal to the pitch of the cable wound on, or unwound from, the winch drum;

(d) a reversible winch drum driving motor for rotating said winch drum in anyone of the two directions; and

(e) means to control the operation of said winch drum driving motor including a control mechanism having a body and an operating member mounted in said body and movable between three positions, namely: one limit position causing the motor to rotate in one direction; a central position causing the motor to stop; and another limit position causing said motor to rotate in the other direction, movement of said operating member relative to said body from said central position to one of the other of said limit positions, and vice versa, causing acceleration and deceleration of said winch drum driving motor, a control-

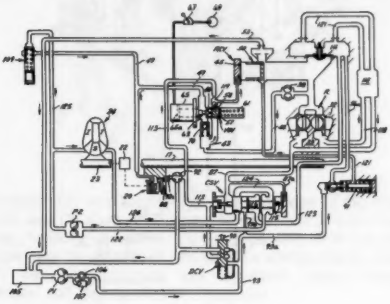
ling reversible motor having an output shaft, a control member responsive to and movable at a speed proportional to the speed of said output shaft and means responsive to the difference of movements of said control member and of said winch drum to move said operating member between its three positions relative to said body.

4,324,387

POWER DELIVERY SYSTEM HAVING A PRESSURE MODULATED HYDRODYNAMIC RETARDER FOR CONTROLLING A LOAD

Horst G. Steinhagen, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 30, 1980, Ser. No. 116,792
Int. Cl.³ B66D *5/02*; F16D *57/02*
U.S. Cl. 254—310 **35 Claims**



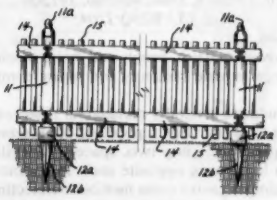
1. A power delivery system comprising a pressurized fluid circuit, a fluid pressurized and modulatable hydrodynamic retarder having a rotor drivingly connected to a power output shaft, said retarder having a pressure fluid inlet and a pressure fluid outlet in said circuit, a retarder outlet pressure control valve in said circuit, speed sensing means for sensing the rotational speed of said output shaft and for producing a corresponding pilot signal acting upon the retarder outlet pressure control valve, including means to infinitely modulate the fluid relief pressure of said valve as a predetermined and selectively variable function of rotor speed to thereby modulate the torque of said retarder in accordance with a predetermined desired torque-speed relationship.

4,324,388

FENCE STRUCTURE

William A. Klaser, 1619 Lincoln Ave., Evansville, Ind. 47714

Filed Oct. 27, 1980, Ser. No. 200,926
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—19 **3 Claims**



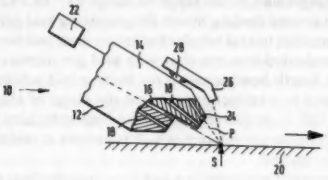
1. A fence structure comprising, in combination, a fence post having an anchor, and rails interconnecting said fence post, where said fence post and said rails are fabricated from a plastic resin, and where said fence post is separable into a post anchor and a post, said post anchor having a lower cone portion extending downwardly and inwardly to a point and includes outwardly extending tapered flanges along the outer surfaces thereof and an upper polygonal portion socket slidably receiving said post on top of said cone and having a bottom wall extending radially beyond the largest diameter of said flanges.

4,324,389

DEVICE FOR SCARFING THE SURFACE OF A METAL WORKPIECE

Alfred Baier, Kronberg, and Alfred Pfeuffer, Neu-Isenburg, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 29, 1981, Ser. No. 258,674
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018648
Int. Cl.³ B23K *7/06, 7/08*
U.S. Cl. 266—51 **5 Claims**



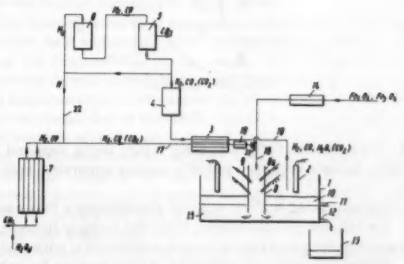
1. In a device for scarfing the surface of a metal workpiece, consisting of an upper and lower preheating block arranged at a distance from each other with a scarfing oxygen channel formed therebetween, and with an extra scarfing nozzle which can be actuated by a shutoff valve as well as with a powder supply apparatus associated with the device, the improvement being said powder supply apparatus having a plurality of discharge nozzles connected by pipelines to a supply bin, shutoff valve means associated with said pipelines, and at least one extra scarfing nozzle associated with one of said powder discharge nozzles.

4,324,390

APPARATUS FOR MANUFACTURING STEEL FROM IRON ORE DUST BY DIRECT REDUCTION

Manfred Driemeyer, Issum, Fed. Rep. of Germany, assignor to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Division of Ser. No. 83,387, Oct. 10, 1979. This application May 22, 1980, Ser. No. 152,348
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844056
Int. Cl.³ F27B *3/08, 3/18*
U.S. Cl. 266—155 **5 Claims**



1. An apparatus for manufacturing steel by direct reduction of iron ore dust, comprising

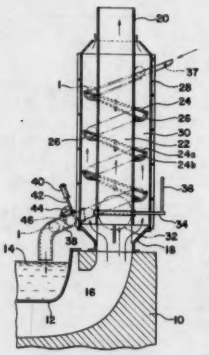
(a) a single reactor vessel capable of containing both a smelting aggregate and a slag layer;
(b) said reactor vessel having a first heating means to maintain said smelting aggregage in the molten state;
(c) a metal tap located in the lower portion of said vessel for tapping said smelting aggregate;
(d) a slag tap located above said metal tap for tapping said slag layer;
(e) a tubular reduction duct vertically disposed in said reactor vessel, said reduction duct extending downwardly into said smelting aggregate below the surface layer of said smelting aggregate and to a point closely adjacent the bottom of said reactor vessel;
(f) a first feeding means for providing a reducing gas mixture containing a monoxide and predominantly H_2 to said tubular reduction duct;
(g) a second heating means for heating said first feeding means and said gas mixture provided thereby;
(h) a third heating means for preheating iron ore dust to a temperaure in the range of about 400° to 800° C.;
(i) a second feeding means for providing said preheated iron ore dust to said tubular reduction duct and for mixing said preheated iron ore dust with said gas mixture;
(j) a fourth heating means for heating said tubular reduction duct to a temperature within the range of about 1000° to 1400° C. to thereby utilize the high reduction potential of H_2 of the gas mixture which is present at said temperature range, and;
(k) means for recovering and recycling the heat and components of waste gases of said reactor vessel.

4,324,391

PRE-HEATING ASSEMBLY TO BE USED FOR PRE-HEATING INGOTS

Terumoto Yamaguchi, Anjo, and Masaya Ohta, Toyohashi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jun. 5, 1980, Ser. No. 156,873
Claims priority, application Japan, Jun. 15, 1979, 54-82710
Int. Cl.³ F27B *1/20, 14/00*
U.S. Cl. 266—200 **8 Claims**



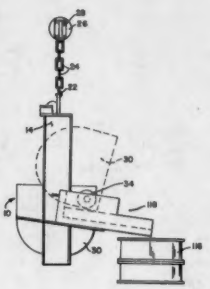
1. A pre-heater for pre-heating ingots being supplied to a melting furnace such as a pot of a casting apparatus, comprising:
a first elongated hollow member constituting a first passage for exhaust gas discharged from the melting furnace;
a second elongated hollow member concentric with said first hollow member and defining a second passage for exhaust gas between said first hollow member and said second hollow member;
a damper in the lower end of at least one of said passages for substantially closing off the passage to the flow of exhaust gas; and
an ingot supplying passage means sloping downwardly through said one passage for guiding movement of successive ingots down along said ingot supplying passage means for pre-heating each of said ingots prior to its introduction into the melting furnace.

4,324,392

MOLTEN METAL POURING DEVICE

Ellis S. White, Elkhart; William C. Zatkoff, South Bend, both of Ind.; John J. Light, Niles, Mich., and Ramon Michen, Mishawaka, Ind., assignors to Sandmold Systems, Inc., Newaygo, Mich.

Filed Feb. 4, 1980, Ser. No. 118,476
Int. Cl.³ B22D *37/00*
U.S. Cl. 266—240 **11 Claims**



1. Apparatus for manually pouring molten metal into a pouring cup in a mold comprising:
an elongate ladle for holding molten metal, the ladle having a pair of opposed end walls and having a pair of opposed side walls and a bottom wall, the cross section of the side walls and bottom wall along a section perpendicular to a longitudinal axis of the ladle having a "U" shaped outer periphery which for each section between the opposed end walls is of similar size and shape;
means for tilting the ladle about an axis of rotation to pour molten metal therefrom; and
the ladle having a molten metal discharge spout coincident with the axis of rotation of the ladle whereby upon tilting the ladle molten metal is discharged through the spout in a direction coincident with the axis of rotation of the ladle.

4,324,393

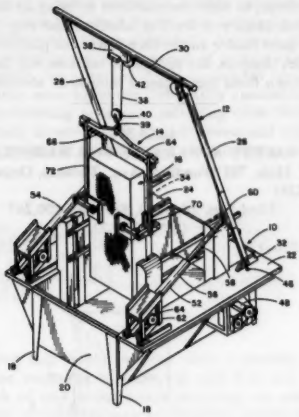
HEAVY DUTY RADIATOR BENCH AND HOIST

Leon C. Chausse, Bellevue, Nebr., assignor to Inland Manufacturing Company, Omaha, Nebr.

Filed May 8, 1980, Ser. No. 147,936
Int. Cl.³ B23Q *1/04*
U.S. Cl. 269—46 **5 Claims**

1. An improved radiator bench and hoist mechanism for positioning large vehicle radiators for repair comprising, in combination:
a bench including a generally rectangular reservoir, a planar top and at least four legs supporting the reservoir;
a gantry support including two, spaced, generally parallel legs, each leg having opposite ends, said gantry support also including a gantry cross member connecting one end of the legs, each of said legs having the opposite end pivotally attached to the bench substantially at the planar top and substantially adjacent one edge of the reservoir, one of said legs positioned on each side of the reservoir;
radiator clamp means for gripping a vehicle radiator, said clamp means being supported for vertical movement by the gantry cross member; and

adjustable gantry bracket means connecting each of the legs of the gantry support to the bench for adjustably pivoting the gantry cross member between a position over the reservoir and a position adjacent the bench, each of the adjustable gantry bracket means extending substantially



between (1) an edge opposite said one edge of the reservoir and (2) a point between the two ends of one of the legs, whereby a radiator resting alongside of the mechanism may be gripped by the radiator clamp means, raised by the gantry support and adjustable gantry bracket means, and deposited in the reservoir.

4,324,394

DEVICE FOR SEPARATING RECORD CARRYING ITEMS

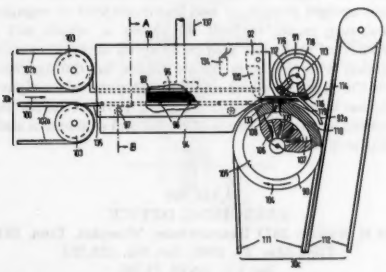
Wilhelm Mitzel, Neu-Keferloh, and Herbert Bernardi, Haag, both of Fed. Rep. of Germany, assignors to G A O Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 867,011, Jan. 5, 1978, and a continuation-in-part of Ser. No. 25,196, Mar. 29, 1979. This application Jan. 24, 1980, Ser. No. 115,074

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729830; Mar. 4, 1978, 2814306

Int. Cl.³ B65H *3/14*

U.S. Cl. 271—5 **11 Claims**



1. A feeder device for feeding sheets of a stack of paper sheets, such as bank notes, one at a time through a feed path from a stack feeder device to a sheet receiving device comprising: an air conducting plate having a surface for receiving the stack disposed along the feed path, said air conducting plate being mounted adjacent to and upstream of the receiving device and adjacent to the feeder device for conveying the stack through the feed path, said air conducting plate having a plurality of air air blast passages extending therethrough each of said passages having a hole in said surface at longitudinally and transversely aligned and spaced intervals along the length and width thereof, each of said passages extending obliquely of the feed path in the direction of the sheet receiving device, fluid pressure means connected to said passages for discharging a stream of pressurized fluid along the feed path in the direction of the sheet receiving device and producing a low pressure along said surface of said air conducting plate adjacent the feed path to pneumatically feed a sheet to the sheet receiving device and at least some of said passages of said holes aligned at the transversely spaced intervals along the width of said plate being divergent to opposite sides of the feed path, wherein said surface of said air conducting plate is divided into a plurality of air conducting areas, each of said air conducting areas including at least some air blast passages, and wherein each of said air conducting areas extends the length of said air conducting plate along said feed path with the orientation of each of said air blast passages in every one of said air conducting areas connected to longitudinally aligned holes in said air conduction area being parallel with each other, and said receiving device comprising a feeding suction drum rotatably mounted with its periphery adjacent the feed path and moving in the feed path direction and a retaining suction drum rotatably mounted with its periphery adjacent the feed path and moving in a direction opposite the feed path direction, adapted to retain sheets in the stack adjacent a sheet to be fed, with a feed slot defined between the peripheries of said feeding and retaining suction drums in the feed path.

4,324,395

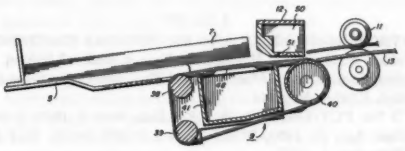
SHEET SEPARATOR

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1979, Ser. No. 81,591

Int. Cl.³ B65H *3/12*

U.S. Cl. 271—98 **5 Claims**



1. A bottom sheet separator-feeder for separating and forwarding sheets seriatum comprising;

a stack tray adapted for supporting a stack of sheets,

frictional feed means comprising a plurality of feed belts spaced below the supported position of the planar surface of the bottom sheet in the stack,

means forming a vacuum plenum associated with said feed means, said vacuum plenum having openings therein facing the bottom sheet in the stack, and having a raised portion therein underlying at least one of said belts to raise at least one of said belts above the plane of the top surface of the remainder of said belts, means for lowering the air pressure in said plenum below atmospheric pressure causing the bottom sheet in the stack to be drawn into contact with and acquired by said feed means, said feed belts thereby forming a corrugation in said sheet by said raised belt for separation and forwarding of the bottom sheet from said stack; and,

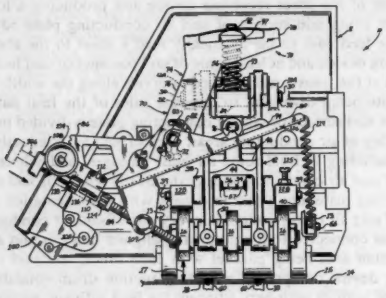
air knife means to direct an air flow against the lead edge of the acquired bottom sheet from the remainder of the sheets in the stack and reduce drag forces between the bottom sheet and the bottom of the remainder of the stack.

4,324,396

SHEET SEPARATING AND FEEDING APPARATUS

David B. Albright, Stratford, Conn., and Joseph A. Conti, Whitestone, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 12, 1980, Ser. No. 148,866
Int. Cl.[3] B65H *3/52*
U.S. Cl. 271—125 8 Claims



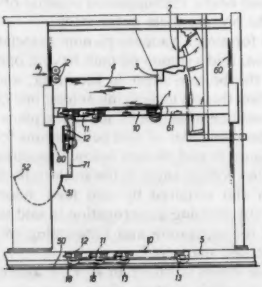
8. Apparatus for separating and feeding sheets, comprising: (a) a sheet feeding deck; (b) a sheet separating stone; (c) means for carrying the stone in overhanging relationship with respect to the deck; (d) a movable frame connected to the stone carrying means; (e) a shaft having a free end, knob means mounted on the free end of the shaft and manually rotatable for rotating said shaft, said shaft threadably engaging the frame for movement thereof to move the stone to a selected height above said deck when said shaft is rotated; and (f) means for permitting the shaft to be manually pushed for movement of said shaft without rotation thereof thereby raising the stone above the selected height, said means for permitting including a collar and spring means cooperative with each other for constraining rotation of said shaft when said shaft is pushed.

4,324,397

STACKING DEVICES AND PLATFORMS THEREFOR

Graham A. Byrt, and Bernard A. Graves, both of Bristol, England, assignors to Masson Scott Thrissell Engineering Limited, Bristol, England

PCT No. PCT/GB79100148, § 371 Date May 8, 1980, § 102(e) Date Apr. 28, 1980, PCT Pub. No. WO80/00560, PCT Pub. Date Apr. 3, 1980
PCT Filed Sep. 7, 1979, Ser. No. 194,151
Claims priority, application United Kingdom, Sep. 8, 1978, 36082/78
Int. Cl.[3] B65H *31/10, 31/20*
U.S. Cl. 271—217 9 Claims



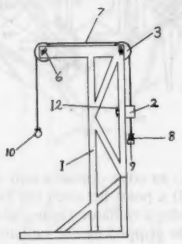
1. A sheet stacking device including a sheet feeder, a platform constructed so that its effective length can be varied, said platform comprising at least two sections pivoted together, the axis of each pivot extending horizontally at right angles to the length of the platform, means for supporting said platform in a horizontal plane, and lifting means adapted to engage with one or more of the platform sections forming said effective length of the platform, to raise the platform to bring its thus engaged section or sections to a level at which sheets may be received from said sheet feeder and to then lower the platform as a stack accumulates thereon, the section or sections not thus engaged hanging down from the engaged section or sections.

4,324,398

SAFETY APPARATUS FOR BARBELL

Robert W. Hole, 781 Woodbine Ave., Toronto, Ontario, Canada (M4E 2J5)

Filed Sep. 24, 1980, Ser. No. 190,247
Int. Cl.[3] A63B *21/06*
U.S. Cl. 272—123 2 Claims



1. A weight-lifting apparatus for use in bench press and/or squat weight-lifting exercises comprising:

(a) a frame having an upright portion and an overhead boom portion arranged to be located at one side and above an exercising station, respectively,

(b) guide means on said upright portion and said boom portion defining a pair of spaced parallel guide tracks,

(c) a pair of cables mounted one on each guide track for movement therealong, a first portion of each cable depending vertically from the overhead boom into said exercising station and a second portion of each cable depending proximate the upright portion,

(d) mounting means on the first portion of each cable receiving a weight-lifting bar in a horizontal position extending therebetween,

(e) first stop means on the second portion of each cable to limit movement of the cables, and second stop means on said upright portion of said frame adapted to engage the first stop means to limit the extent to which said first portion of said cable may be lowered into said exercising station whereby upon release of the bar during exercise use the extent to which it will travel when said weight-lifting bar is released and the extent of travel of the bar, being limited by the interaction of the second stop means and the first stop means.

4,324,399

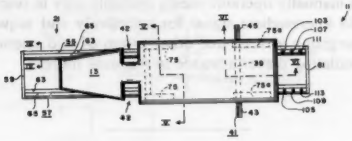
EXERCISING DEVICE

Robert B. Rickey, 2871 Bannockburn, Memphis, Tenn. 38128

Filed May 27, 1980, Ser. No. 153,752
Int. Cl.[3] A63B *23/00*
U.S. Cl. 272—144 1 Claim

1. An exercising device for exercising particular muscles of a user as he selectively accomplishes various exercises in conjunction therewith, said exercising device comprising an oblong planar board member for supporting the user in any of several exercising positions, fore and aft roller means for runningly ridably supporting said board member in a horizontal

disposition, track means for supportable engagement with said roller means as said board member is being runningly ridably supported by said roller means in a to-and-fro travel of said board member, and means for promoting resistance against enabling said planar board member to merely be free to travel to-and-fro as it is being runningly ridably supported by said roller means upon said track means, said means for promoting resistance effectively being utilized by requiring the user to exert more effort in the performance of certain exercise than would normally be expected if the to-and-fro travel of said board member were to be conventionally unconstrained, said means for promoting resistance including close fitting means for abnormally developing friction between said roller means and said planar board member, said close fitting means including providing said board member with a plurality of block members for respectively engaging said fore and aft roller means, each of said roller means including an axle member having a pair of track engageable wheellike members disposed adjacent opposite ends thereof and being integrally joined therewith thus precluding relative rotation between said wheellike members and said axle member, each of said block members being provided with an arcuate shaped downwardly directed groove compatibly sized with said axle member for reception therein but in a particular fashion in which a close fitting relationship of said axle member within said arcuate shaped groove is established for purposely causing the development of friction therebetween as rotation of said axle member is established by the to-and-fro travel of said board member.

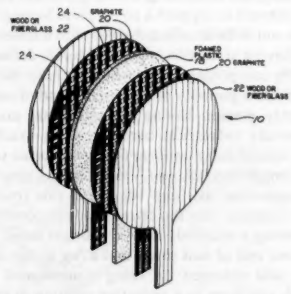


4,324,400

TABLE TENNIS BAT BLADE

Jackson Tse, Bellevue, Wash., assignor to EST Industries, Inc., Wash.

Filed Aug. 8, 1979, Ser. No. 64,555
Int. Cl.³ A63B 59/04
U.S. Cl. 273—76 **5 Claims**



3. In a table tennis bat blade having a solid blade portion constituting the striking surfaces and a handle, such solid blade portion including a central core layer of lightweight, rigid, foamed plastic material, an improved blade portion comprising:

an intermediate, substantially homogeneous constraining layer of high modulus of elasticity graphite fibers arranged in a relatively thin layer and bonded to the two outer surfaces of the central core layer, said constraining layers having a modulus of elasticity of approximately 30 to 100 million pounds per square inch;

a thin outer layer of smooth, rigid, lightweight material overlying both constraining layers, said outer layers having a minimum modulus of elasticity of at least one million pounds per square inch and a maximum modulus of elasticity substantially lower than the modulus of elasticity of said constraining layers; and

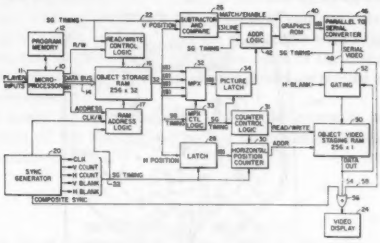
said central core layer having a modulus of elasticity of approximately 12,000 to 16,000 pounds per square inch.

4,324,401

METHOD AND SYSTEM FOR GENERATING MOVING OBJECTS ON A VIDEO DISPLAY SCREEN

David R. Stubben, Milpitas, and Lyle V. Rains, San Jose, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 15, 1979, Ser. No. 3,445
Int. Cl.³ A63F 9/22
U.S. Cl. 273—85 G **15 Claims**



1. Apparatus for controlling the display of different objects on a raster scan video display screen of the type having image-forming means including a controllable electron beam forming a plurality of horizontal lines in response to horizontal and vertical timing signals, including horizontal retrace intervals, the apparatus comprising:

first memory means for storing data indicative of the desired position of first ones of said objects on the display screen;

means for scanning the first memory means during each horizontal retrace interval and for determining the objects to be displayed for the next horizontal line;

second memory means for containing video data for the objects to be displayed, the second memory means being responsive to the scanning means and the object position data obtained from the first memory means to provide said video data for the objects to be displayed for the next horizontal line;

third memory means for temporarily storing said video data at locations corresponding to the horizontal position of the video data within the next horizontal line; and

means for sequentially accessing the temporarily stored video data from said third memory means synchronously with the electron beam scan during each horizontal line and for communicating the accessed data to the video display screen.

7. A method of controlling the display of different objects on a video display screen of the type having image-forming means including a controllable electron beam for scanning said video display screen to form a plurality of horizontal line scans in response to horizontal and vertical timing signals, including horizontal retrace intervals, said method comprising the steps of:

storing data indicative of the desired position of first ones of said objects on the display screen in a first memory;

during each horizontal retrace interval preceding each active horizontal line:

a. scanning the object position data in said first memory

and determining the objects to be displayed for the next horizontal line scan;

b. accessing video data for the objects to be displayed in the upcoming horizontal line scan from a second memory;

c. temporarily storing said video data in a third memory at locations corresponding to the horizontal position of the video data within the upcoming horizontal line scan; and

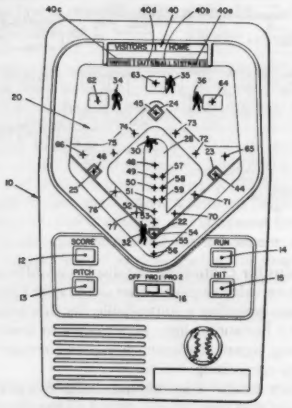
during each horizontal line scan, sequentially accessing said video data from said third memory synchronously with the electron beam and communicating said accessed video data to said video display screen for display.

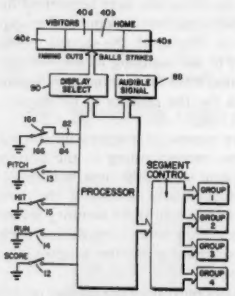
4,324,402

ELECTRONIC BASEBALL GAME

George J. Klose, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 5, 1979, Ser. No. 1,231
Int. Cl.³ A63F 9/00
U.S. Cl. 273—88 **23 Claims**





1. In an electronic game for simulating baseball or the like having a defined playing field with a defined path of travel of an object such as a ball to a defined opposing player location for contact therewith, the player then traveling a defined player advance path to the point of origin, the combination comprising;

a playing field;

a plurality of groups of illuminatable segments on said playing field, each segment within a group having a predetermined location and each group of segments having a predetermined orientation relative to each other;

control means internal to said game for selectively illuminating one or more segments of one or more of said groups;

first manually operable means providing a first input signal to said control means for sequentially energizing the segments of one of said groups to simulate the path of travel of an object;

second manually operable means for providing a second input signal to said control means;

means responsive to a timed relation between said second input signal and the illumination of one of a selected number of segments of said one group for providing an intermediate signal; and

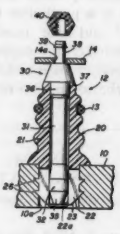
third manually operable means operable only in response to said intermediate signal for selectively and sequentially energizing at least one other group of said segments for simulating player advance in response thereto.

4,324,403

POST ASSEMBLY FOR PINBALL GAME

Vahram K. Sarrafian, Glenview, and Syng N. Kim, Hoffman Estates, both of Ill., assignors to Max Wiczer, Skokie, Ill.

Filed Aug. 25, 1980, Ser. No. 180,633
Int. Cl.³ A63B 71/00
U.S. Cl. 273—127 R **8 Claims**

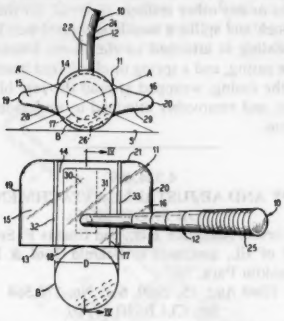


1. A post assembly for use in a pinball game having a playfield board for supporting a rolling pinball, the post assembly being adapted to support a cover plate having at least one hole therein and to be attached thereto with a fastener, the playfield board having at least one opening therein defined by a wall, the assembly comprising a post which includes an elongated body portion and a plurality of legs on one end of said body portion, said body portion having a longitudinal axis and having a substantially cylindrical bore extending axially therethrough and of substantially uniform transverse cross section along the entire length thereof, said legs extending generally parallel to the longitudinal axis and being movable toward said axis to enable insertion into the opening of the playfield board, and a plug having a relatively long cylindrical shank and an enlarged tip at one end of said shank and a lug at the other end of said shank, said enlarged tip being dimensioned to be received through said bore to a mounting position in engagement with said legs for forcing said legs outwardly into engagement with the wall of the opening, each of said legs having projections extending laterally outwardly therefrom and adapted to be embedded in the wall of the opening when said legs are forced outwardly by movement of said plug to the mounting position thereof, said lug extending beyond the other end of said post generally parallel to said longitudinal axis when said enlarged tip is in the mounting position thereof and having a diameter to enable insertion through the hole in the cover plate.

4,324,404
GOLF PUTTER

Walter Dian, Downers Grove, Ill., assignor to Walter Dian, Inc., Downers Grove, Ill.

Filed May 19, 1980, Ser. No. 151,373
Int. Cl.³ A63B 53/04
U.S. Cl. 273—169 4 Claims

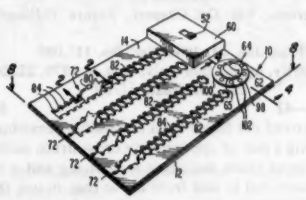


2. A golf club putter comprising an elongated shaft, a transparent rectangular head on said shaft having an upright front putting face, a substantial front to rear longitudinally extending depth, a thick longitudinally extending central portion with front to rear extending sides and relatively thin toe and heel wings of less height than said central portion radiating laterally from said sides and having bottom surfaces at levels above the bottom of said thick central portion, an elongated heavy weight rod encased in the thick longitudinally extending central portion of said head and extending longitudinally from said putting face in the front to rear direction and visible along the length thereof through said transparent head, said rod having an end flush with said upright putting face, said rod having a heavier mass below the longitudinal axis thereof than the mass above said axis positioned to counteract the effect of the shaft in changing the sweet spot, and said shaft being anchored in the front third of the rod and extending upwardly therefrom through said transparent head.

4,324,405
BOARD GAMES HAVING VARIABLE GAME-PIECE-ENERGIZED CIRCUITS

Frederick W. Kruger, Jr., Churchville, Pa., and Warren E. Bosch, Beverly, N.J., assignors to Product Dynamics, Ltd., Levittown, Pa.

Filed Mar. 31, 1980, Ser. No. 135,955
Int. Cl.³ A63F 3/00
U.S. Cl. 273—238 4 Claims



1. A game comprising:

(a) a base plate having a circuit grid including:

(1) a first side of a given polarity formed with a single elongated main circuit element and with several branch elements connected to and extending from the main element at one end thereof;

(2) a second side of opposite polarity formed with a multiplicity of circuit element groups each including an elongated main element and several branch elements all of which are connected to and extend from one end of the main element of the same group, the branch elements of the first side alternating with and extending generally parallel to the branch elements of each of the several groups that comprise said multiplicity of groups, said main elements of the several groups having terminals at their other ends arranged in an annular series,

(3) a common terminal centered in said series,

(4) means for connecting the common terminal and the other end of the main circuit element of the first side to opposite sides of a source of electrical power, and

(5) a circuit selector overlying said common terminal and the several terminals of the annular series and having a bridging element for connecting the common terminal to at least one but less than all the terminals of said series, in selected positions to which the selector is rotated;

(b) a cover plate overlying and laminated with the base plate and having a series of slots each of which extends across all the branch elements of both sides of the circuit but omits traverse of the main elements;

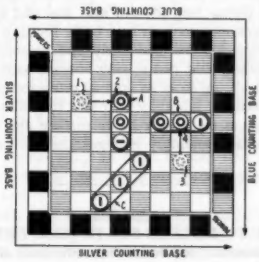
(c) playing pieces each of which is movable along an associated slot and includes a signal element and contacts that are in circuit therewith and are engageable with adjacent branch elements of the respective sides of the circuit in each position to which the playing pieces are moved along the slots; and

(d) means for determining by chance the extent to which each of the playing pieces may be advanced within its associated slot.

4,324,406
BOARD GAME METHOD

Joseph D. Ocampo, 2437 Warring - Apt. D, Berkeley, Calif. 94704

Filed Apr. 7, 1980, Ser. No. 138,100
Int. Cl.³ A63F 3/00
U.S. Cl. 273—242 1 Claim



1. A method of playing a game adapted to be played on a board, which comprises the steps of:

each player or team placing a set of markers, each marker containing a single digit and at least two different digits in each set, on the individual marker locations;

assigning a reading direction or directions to each player or team in relation to the playing surface, the direction or directions being different for each player or team;

sequentially moving the markers to individual marker locations;

positioning a plurality of markers adjacent to one another forming a multidigit number, with each digit of the multidigit number formed from a single marker;

separately reading in the players assigned direction each of the plurality of markers forming the multidigit number;

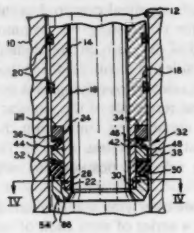
recording as a score the multidigit number that was read.

4,324,407

PRESSURE ACTUATED METAL-TO-METAL SEAL

Neil R. Upham, Jackson, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 6, 1980, Ser. No. 194,609
Int. Cl.[3] F16J 15/06, 15/48
U.S. Cl. 277—27 9 Claims



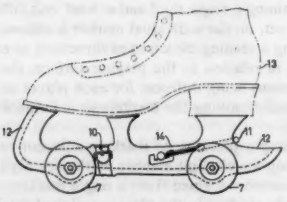
1. A seal assembly for a pressurized system for sealling a cylindrical conduit received within a cylindrical bore comprising, in combination, a tubular body having an axis, a cylindrical outer surface, an end, an inner reduced diameter cylindrical surface defined on said body of lesser diameter than said exterior surface and intersecting said body end, and an abutment defined on said body adjacent said inner surface and axially spaced from said end, an anvil ring circumscribing said inner surface engaging said abutment and having a conical anvil surface facing said body end, an annular conical deformable metal seal ring having inner and outer circular seal surfaces circumscribing said inner body surface having deformable radially expanded and retracted conditions, said seal ring having an expanded radial dimension greater than the radial dimensional difference between said body outer and inner surfaces, an annular piston ring circumscribing said body inner surface and axially displaceable thereon, said piston ring including a conical seal ring engagable surface disposed toward said seal ring and a pressure surface disposed toward said body end acted upon by the pressure within the system to axially displace said piston ring toward said seal and anvil ring, and retaining means mounted on said body limiting movement of said piston ring toward said body end, pressure within the system displacing said piston ring toward said anvil ring to deform said seal ring from its normal retracted condition to its expanded condition whereby said seal ring inner seal surface sealingly engages said body inner surface and said seal ring outer seal surface sealingly engages the bore receiving said body.

4,324,408

ICE TO ROLLER SKATE CONVERTER

Leonard E. Bensette, and Joann Bensette, both of 468 Rosedale Ave., Windsor, Ontario, Canada (N9C 2N4)

Filed Jul. 8, 1980, Ser. No. 166,710
Int. Cl.[3] A63C 17/18
U.S. Cl. 280—7.13 1 Claim



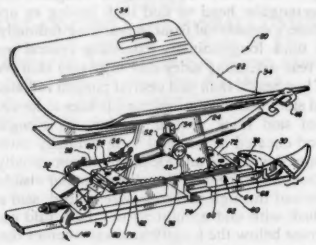
1. A device for converting boot-attached ice skates to roller skates, which consists of a casing which is used in connection with figure type of boot-attached ice skates, in which the blade supports which attach the said blade to the heel and sole of the boot are integral extensions of the blade, the said casing extending upwardly to cover the exterior of such extensions, including the entire skate blade; in combination with a pair of regulation roller skate wheels attached to the front and rear of said casing, said wheels rotating on shafts which pass through and are supported by said casing, and said shafts being embedded in rubber or any other resilient material, for the purpose of reducing shock and spills; a buckle equipped belt by means of which the casing is attached to the skate, located near the center of the casing; and a spring or elasticized band, located in the rear of the casing, wrapped around the rear blade to boot heel support, and removably attached to each side of the casing, in tension.

4,324,409

SLED BODY AND ADJUSTABLE ATTACHMENT MEANS FOR SNOW SKIS

Ronald A. Larsen, Arlington Hts., and Gustav F. Schmid, Palatine, both of Ill., assignors to Schmid Tool & Engineering Corp., Franklin Park, Ill.

Filed Aug. 15, 1980, Ser. No. 178,564
Int. Cl.[3] B62B 13/00
U.S. Cl. 280—12 F 9 Claims



1. A sled body with adjustable mounting apparatus for detachably mounting said body to the bindings of snow skis, said apparatus comprising:

legs extending downwardly from said body,

a sole plate fixed to the lower portion of each leg, and

a toe portion on each sole plate, said toe portion being vertically adjustable with relation to its plate to be received by varying dimensioned ski bindings.

4,324,410

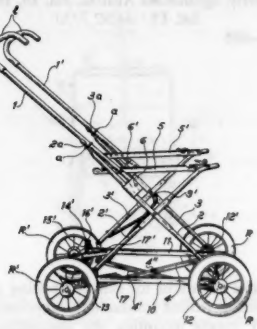
COLLAPSIBLE PERAMBULATOR COT FRAME STRUCTURE INCLUDING TELESCOPIC SIDE MEMBERS

Guiseppe Perego, Via De Gasperi, Arcore (Milano), Italy (20043)

Filed Jan. 31, 1980, Ser. No. 117,096
Claims priority, application Italy, Aug. 9, 1979, 22324/79[U]
Int. Cl.[3] B62B 11/00
U.S. Cl. 280—42 5 Claims

1. An improved cot frame for a collapsible perambulator of the type having a pair of opposed side cross struts, each of said pair of side cross struts including a front leg and a rear leg adjacently connected to said front leg so that, in use, the front leg extends diagonally downwardly toward the front of the perambulator and the rear leg extends diagonally downwardly toward the rear of the perambulator, pivot means interconnecting said rear leg and said adjacent front leg of each of said pair of said cross struts intermediate the ends thereof, an arm member pivotally connected to the upper end portion of each front leg, a base cross strut including crossing arm struts pivoted together intermediate to the ends thereof, means for pivoting the opposed ends of the respective crossing arm struts

of said base cross strut to the lower end portion of a respective front leg and rear leg of said opposed side cross struts, the improvement comprising side elements interconnecting the side ends of the base cross strut at opposite sides of the frame whereby the structure is strengthened, each of said side elements including an outer tubular member and an inner tubular member telescopically received in said outer tubular member said inner tubular member having ends fixed to ends of said base cross strut, said outer tubular member having ends fixed to the opposite ends of said base cross strut so that the folding of



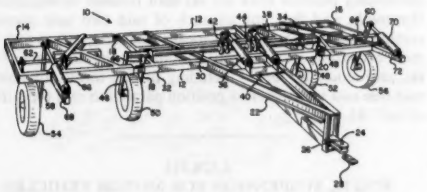
the base cross strut causes the sliding of said inner tubular member relative to the outer tubular member of the said side members, and further comprising first U-shaped rod means for fixing the ends of said inner tubular member to the lower ends of said front legs of the side cross struts, second U-shaped rod means for fixing the opposite ends of said outer tubular members to the lower ends of said rear legs of the side cross struts so that the folding of the side cross struts causes the sliding of said inner tubular member relative to said outer tubular member of the side members.

4,324,411

IMPLEMENT LEVEL LIFT SYSTEM

Hugh J. MacKenzie, Ancaster, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 5, 1980, Ser. No. 156,892
Int. Cl.³ A01B *63/22*
U.S. Cl. 280—43.23 **4 Claims**



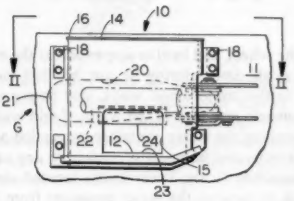
1. An agricultural implement carrier comprising:
a rigid main frame;
a first outrigger frame pivotally connected to said main frame;
a first wheel assembly pivotally mounted on said main frame;
a second wheel assembly pivotally mounted on said first outrigger frame;
a first hydraulic ram operatively connected with said main frame and said first wheel assembly to raise and lower said main frame;
a second hydraulic ram operatively connected with said outrigger frame and said second wheel assembly to raise and lower said first outrigger frame;
said rams hydraulically connected in parallel;
a first rotary flow divider hydraulically connected with said rams for assuring equal flow of hydraulic flow to and from said rams whereby said frames are raised and lowered in unison;
ram rephasing means directly communicating with said rams for equalizing operation of said rams when one of them reached its rod displacement limit; and
said ram rephasing means comprising a flow divider gear by-pass facilitating completion of another ram rod displacement.

4,324,412

COMPOSITE SHIELD-STEP

Bernard J. Wulff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 21,370, Mar. 19, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,757
Int. Cl.³ B60R *3/00*
U.S. Cl. 280—163 **7 Claims**



1. A composite shield-step (10) in combination with an articulated vehicle of the type having a frame (11) with a steering cylinder opening (20) through which vulnerable vehicle components (13) are exposed to damage in the work environment of the vehicle, said shield-step (10) comprising:
a first member (12) having an opening (15) therein with a lower side and positioned about the steering cylinder opening (20) with the first member opening (15) vertically offset from the steering cylinder opening with said vulnerable vehicle components being visible through the openings (20,15) wherein the first member (12) has a general "U" configuration, said first member (12) being mounted externally on said frame (11);
a first step (23) formed on the first member (12), said first step (23) constituting an edge of said first member (12) which bounds the lower side of said first member's opening (15); and
a second step (14) formed by at least one rigid elongate member (25) extending between the legs of the "U" and positioned at the top of the first member (12).

4,324,413

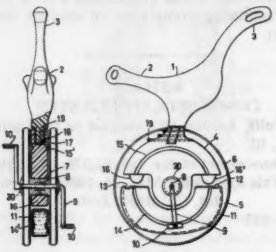
UNICYCLE WITH WATER BALANCE

Leonard E. Bensette, and Joann Bensette, both of 468 Rosedale Ave., Windsor, Ontario, Canada (N9C 2N4)

Filed Jun. 18, 1980, Ser. No. 160,643
Int. Cl.³ B62K *1/00*
U.S. Cl. 280—205 **2 Claims**

1. A unicycle comprising in combination, an upper body shaped to generally resemble a simplified side view of a bird, the rear tail end of which plus its back form a seat for the rider, and the forward and upward continuation of said back form the neck of said bird, by means of which the rider holds on and steers the unicycle; a lower body which serves to support the wheel of the unicycle is attached to the said upper body by means of a telescopic, pin-held, height adjustment connection, which takes care of the usual difference in height between different sized riders; a wheel consisting of two parallel, rubber

tired, circular walls, which are spaced from each other, each of said walls having half of their common hub attached thereto; a horizontal pedal bar which passes through the center of said hub sections and is keyed to them, said horizontal pedal bar having one side thereof bent at right angles to it, to form a vertical support for one of the foot pedals; the other end of said horizontal pedal bar being provided with a removable and reattachable vertical support for the other foot pedal; a semi-circular water container located loosely between the spaced



walls of the wheel, and held in suspension at the bottom of the unicycle at all times, during its use, by free moving bosses attached to the inside wheel walls, said bosses sliding freely within channels provided in the walls of said water container thereby keeping the water container suspended at the bottom of the unicycle; and bumpers of rubber or any other resilient material attached to the lower body, located above the said water tank, to prevent the water container from being pulled along by the rotation of the wheels; and said water tank being provided with a water filling plug and an air relief valve.

4,324,414

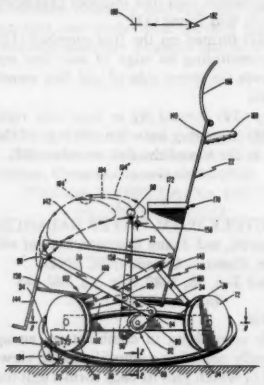
WHEELCHAIR

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 953,843, Oct. 23, 1978, Pat. No. 4,247,127. This application Jul. 29, 1980, Ser. No. 173,440

Int. Cl.³ B62M *1/06, 1/16, 3/06*

U.S. Cl. 280—242 WC **12 Claims**



1. In a wheelchair of the type having a seat and a rolling suspension means, the improvement comprising locomotion means for driving the suspension means, the locomotion means including hand operable levers having end portions which orbit in a cambered elliptical path to efficiently utilize human anatomical strengths and weaknesses, the end portions being operable to drive the locomotion means throughout the orbit.

4,324,415

DEVICE FOR SKIS

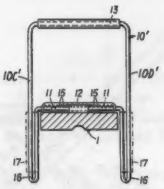
Gottfried Schweizer; Axel Kubelka; Karl Stritzl, all of Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Division of Ser. No. 705,268, Jul. 14, 1976, Pat. No. 4,189,163. This application Nov. 2, 1979, Ser. No. 90,788

Claims priority, application Austria, Jul. 18, 1975, 5599/75

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **6 Claims**



1. A ski brake apparatus for skis comprising an upstanding bracket adapted to extend substantially transversely across its associated ski, means mounting the upstanding bracket for pivotable movement about a transverse axis into a position bearing substantially flatly against the top surface of the ski, said upstanding bracket comprising a resilient spring bracket member having two axle segments, said two axle segments extending transversely to the ski in substantially parallel relationship to one another and terminating at a free end thereof located on said top surface of said ski, said axle segments being spaced from each other in the longitudinal direction of the ski and serving as pivot shafts for the spring bracket member, said spring bracket member having elongated brake arm means thereon and adjacent an end of each of said axle segments remote from said free end thereof which, when said spring bracket member is in said upstanding position, project beneath and beyond the undersurface of said ski, said mounting means comprising a base body, said two axle segments of spring bracket member being pivotably mounted in said base body, the spring bracket member and the pivotable mounting of the axle segments thereof enabling said spring bracket member to resiliently tilt over in the longitudinal direction of said associated ski in the event a user of said ski pushes down upon said spring bracket member with a ski boot, and to return to its upstanding position after the ski boot releases its engagement therewith, said free end of each of said two axle segments remote from said brake arm means including a free end segment extending coextensively with the longitudinal axes of said ski, said mounting means including further means for holding said free end segments in a position parallel to said top surface of said ski.

4,324,416

WHEEL SUSPENSION FOR MOTOR VEHICLES

Manfred Schneeweiss, Wettstetten; Adolf Götzenberger, and Aloys Ohm, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,496

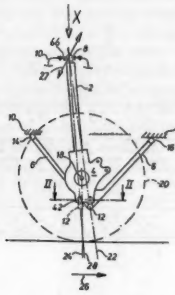
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 29127875

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **5 Claims**

1. A wheel suspension for a motor vehicle comprising a wheel carrier, upper means for operatively connecting said wheel carrier to the body of said vehicle and lower means for operatively connecting said wheel carrier to said vehicle body,

said upper and lower connecting means providing upper and lower pivot joints defining a steering axis about which said wheel carrier is pivotal, said steering axis being disposed at an angle to the vertical providing a predetermined caster, one component of said lower connecting means being disposable in at least a first or a second position to alter the angle of said steering axis relative to the vertical and correspondingly, said caster, said lower pivot joint being disposable at predetermined



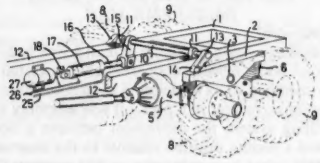
distances from a reference line on said lower connecting means, and a mounting flange mounted on said wheel carrier, said mounting flange being mountable in a first position and mountable in a second position displaced 180° relative to a centerline thereof, said lower pivot joint being disposed on said mounting flange at a point displaced from the center line of said mounting flange a distance equal to the displacement of said lower pivot joint relative to the reference line on said lower connecting means.

4,324,417

VEHICLE WITH BOGIE-MOUNTED WHEELS AND RAISING DEVICE FOR A PAIR OF WHEELS

Sixten A. M. Johansson, Eskilstuna, Sweden, assignor to Volvo BM AB, Eskilstuna, Sweden

Filed Mar. 17, 1980, Ser. No. 130,626
Claims priority, application Sweden, Apr. 23, 1979, 7903536
Int. Cl.³ B60G *11/30*
U.S. Cl. 280—678 **6 Claims**



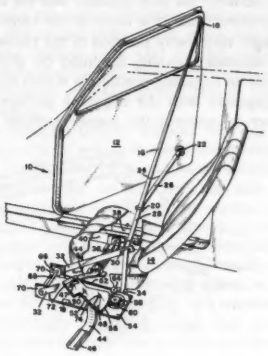
1. A vehicle having a load-carrying frame, a bogie frame disposed on either side of the load-carrying frame, means mounting the bogie frames on the load-carrying frame for vertical swinging movement about a horizontal axis, a first wheel pair mounted on the bogie frames on one side of said axis, a second wheel pair mounted on said bogie frames on the other side of said axis, spring means yieldably urging one said wheel pair downwardly relative to the other said wheel pair, and means for selectively applying and releasing the spring action of said spring means.

4,324,418

PASSIVE SEAT BELT SYSTEM

Robert L. Stephenson, Utica, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 26, 1980, Ser. No. 134,253
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **9 Claims**



1. A passive seat belt system for use in a vehicle having a driver's door and a passenger's door and seating positions adjacent to said doors, said system comprising:

actuating means associated with each of said doors and being actuated upon the opening of the respective door;

seat belt systems associated with each of said seating positions;

belt moving means associated with each of said seat belt systems for moving the same into and out of occupant restraint positions, said seat belt moving means comprising a pair of levers each associated with each of said seating positions and located inboard of said seating positions, said levers being in contact with said seat belt systems, connecting means connecting said levers to each other, a rotatable gear, and cable means extending between said gear and said connecting means; and

means responsive to actuation of each of said actuating means to permit said moving means to move each of said seat belt systems out of its occupant restraint position, said means comprising a rotatable gear segment having gear teeth on one end thereof, said gear teeth being intermeshed with said rotatable gear, and said gear segment being connected to each of said actuating means, whereby upon opening of either of said doors, each of said seat belt systems is moved out of its occupant restraint position.

4,324,419

LATCH FOR RUNNER UTILIZED IN PASSIVE TYPE SEAT BELT SYSTEM

Takeo Ueda, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,779
Claims priority, application Japan, Jun. 6, 1979, 54-75857[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **5 Claims**

1. Latching apparatus for a runner member in a passive type seat belt system comprising:

a longitudinally extending guide member;

a runner member mounted on said guide member for movement therealong, the runner member having an engaging portion and a webbing attachment portion;

a driving member movable responsive to closing and opening of a vehicle door or the like to move said runner member between a passenger restraining position and a passenger releasing position;

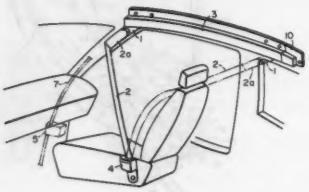
a cam member fixed to a free end portion of said driving member;

a stop member fixed to the driving member spaced inwardly from the cam member;

connecting means between said runner member and said driving member, the connecting means being slidable relative to said driving member within a predetermined range between the stop member and the cam member;

a base member fixed to a body of the vehicle adjacent the passenger restraining position of the runner member; and

a latch member movably mounted on said base member between an engaging position in which the latch member is engageable with the engaging portion of the runner member to connect the runner member with the base



member, and a non-engaging position, the latch member being normally biased toward the engaging position;

movement of the driving member in one direction being effective to bring the stop member into engagement with the connecting means for moving the runner member into the passenger restraining position wherein the latch member engages said engaging portion of the runner member, and movement of the driving member in the opposite direction being effective initially to cause the cam member to move the latch member out of engagement with the runner member and then to move the runner member from the passenger restraining position towards the passenger release position by engagement of the cam member with the connecting means.

4,324,420

HEAT-SENSITIVE RECORDING OR COPYING MATERIAL

Horst Kosche, Düren, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 908,888, May 24, 1978, Pat. No. 4,202,566. This application Jan. 11, 1980, Ser. No. 111,422

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724295; Jul. 1, 1977, 2729739

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ B41M *5/18, 5/22*

U.S. Cl. 282—27.5 **12 Claims**

1. A heat-sensitive recording or copying material comprising at least one colour former and a support which contains or has coated on as developer for the colour former, at least one compound which is the reaction product of a mono- or polyaldehyde substituted by one or more electronegative substituents selected from the group consisting of halogen and cyano and a reactant selected from the group consisting of an epoxide, a carboxylic halide and a dicarboxylic acid anhydride, wherein the aldehyde is bonded to the radical of the reactant by means of at least one oxygen atom.

4,324,421

IDENTITY CARD WITH INCORPORATED FIBRIDS

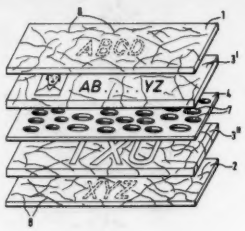
Roland Moraw, Wiesbaden; Peter Steinau, Mainz, and Fritz Pierson, Taunusstein-Hahn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,147

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1978, 2856852

Int. Cl.³ B42D *15/00*; G09F *3/02*

U.S. Cl. 283—7 **17 Claims**



1. An identity card comprising:

(a) at least one outer transparent covering layer and

(b) a thermoplastic core,

said core being produced from a core material comprising fusible thermoplastic fibrids having a specific surface of at least 1 m^2 per gram measured by the BET method; said core material being printable by printing techniques wherein a toner image is produced thereon;

said core further comprising a reinforcing layer which is perforated with holes and is dimensionally stable at a temperature at which said core material is fusible; said core material being laminated through the holes in said reinforcing layer; said reinforcing layer providing dimensional stability for said fusible core material during laminating;

(c) said card carrying at suitable points on at least one of the component parts thereof information serving to identity the cardholder and security markings for protecting against forgeries.

4,324,422

LOW TORQUE PACK-OFF SEAL ASSEMBLY WITH RETRIEVABLE LOWER SECTION

John K. Rains, Ventura, and Larry E. Reimert, Thousand Oaks, both of Calif., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Feb. 27, 1980, Ser. No. 125,301

Int. Cl.³ E21B *33/04*

U.S. Cl. 285—140 **8 Claims**

1. In a drilling system including at least a first body member and a second body member cooperatively associated with the first body member so as to define a clearance space therebetween, the improvement of a pack-off seal assembly supported in the drilling system for movement between a non-sealing position and a sealing position relative to the clearance space and operable when occupying the sealing position thereof to effect a packing off of the clearance space, said pack-off seal assembly comprising:

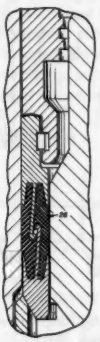
a. a first metal seal means having a first pair of lip portions projecting outwardly therefrom, said first pair of lip portions being operable to establish a metal-to-metal seal between the first and second body members when said pack-off seal assembly occupies the sealing position thereof;

b. a second metal seal means having a second pair of lip portions projecting outwardly therefrom, said second pair of lip portions being operable to establish a metal-to-metal

seal between the first and second body members when said pack-off seal assembly occupies the sealing position thereof;

c. an elastomeric seal ring supported in interposed relation between said first metal seal means and said second metal seal means, said elastomeric seal ring means being operable to establish an elastomeric-to-metal seal between the first and second body members when said pack-off seal assembly occupies the sealing position thereof; and

d. retrieving means cooperatively associated with said first metal seal means and said second metal seal means, said retrieving means including a first elongated member projecting outwardly from said first metal seal means so as to extend in substantially parallel relation to said first pair of lip portions, said first elongated member having the free end thereof extending in a first direction into said elastomeric seal ring so as to be encircled thereby, said retrieving means further including a second elongated member projecting outwardly from said second metal seal means so as to extend in substantially parallel relation to said



second pair of lip portions, said second elongated member having the free end thereof extending in a second direction into said elastomeric seal ring so as to be encircled thereby, said free end of said first elongated member being spaced from said free end of said second elongated member so as to establish a lost motion connection between said first and second elongated members and thereby also between said first metal seal means and said second metal seal means when said pack-off seal assembly is moved in a first direction relative to the clearance space defined by the first and second body members, said free end of said first elongated member being interengaged with said free end of said second elongated member so as to establish a rigid connection between said first and second elongated members and thereby also between said first metal seal means and said second metal seal means when said pack-off seal assembly is moved in a second direction relative to the clearance space defined by the first and second body members thereby to insure the retrievability from the clearance space of said second metal seal means.

4,324,423

TUBULAR FITMENT

Isadore Pitesky, 4001 Linden Ave., Long Beach, Calif. 90807

Continuation of Ser. No. 14,683, Feb. 23, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 177,361

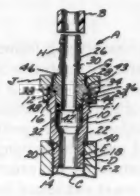
Int. Cl.³ F16L *41/00*

U.S. Cl. 285—156 **6 Claims**

1. In combination with a rigid shell that has a tapped opening therein and that defines a confined space and a resilient tube, a fitment capable of selectively establishing either rotatable or fixed communication between said resilient tube and said confined space, said fitment including:

a. a first elongate tubular member that has first and second end portions that have a longitudinal smooth surfaced first bore extending therebetween, said first and second end portions having first and second transverse ring shaped surface extremities, said first end portion having first external threads defined thereon, said second end portion having second external threads defined thereon that extend longitudinally from said second ring shaped surface extremity to a transverse circumferentially extending first groove in said second end portion, and a part of said first groove most remote from said second transverse ring shaped extremity defining a first circumferentially extending body shoulder with said second threads engaging said tapped opening;

b. a second elongate tubular member that has third and fourth end portions and an intermediate portion therebetween, a longitudinal passage in said second elongate tubular member that extends between said third and fourth end portions, said third end portion of circular transverse cross section and such size as to snuggly and slidably engage said first longitudinal bore adjacent said first end portion, a second circumferentially extending groove in said third end portion, first means on said fourth end portion for sealingly engaging said resilient tube, and a circumferentially extending flange that projects outwardly from said intermediate portion, said flange having



first and second longitudinally spaced ring shaped end faces;

c. first and second resilient sealing rings disposed in said first and second grooves, said first resilient sealing ring being compressed and effecting a fluid tight seal between said body shoulder and said rigid material adjacent said tapped opening when said first sealing ring is compressed, and said second resilient sealing ring effecting a rotatable and slidable seal between said third end portion and said first longitudinal bore when said third end portion is slid longitudinally into the latter to dispose said first ring shaped face adjacent said first ring shaped end surface; and

d. a ring shaped collar that has an internal circular abutment from which second and third bores extend longitudinally in opposite directions, said second bore having third threads defined therein, said third bore capable of being slid downwardly over said flange for said third threads to engage said first threads, said second tubular member and said resilient tubing capable of being rotated relative to said first tubular member until said collar is screwed downwardly on said first threads to the extent said first and second ring shaped faces of said flange are frictionally gripped between said first ring shaped surface and said abutment to the extent rotation of said second tubular member relative to said first tubular member is no longer possible.

4,324,424

SLIP-TYPE CONDUIT HUB FOR ENCLOSURES

Ronald D. Woodliff, Milwaukee; Kenneth L. Paape, Mequon, and Edwin S. Johnston, New Berlin, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Dec. 26, 1979, Ser. No. 106,590

Int. Cl.³ F16L *3/04*

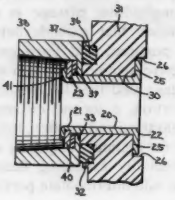
U.S. Cl. 285—158 **3 Claims**

1. In a non-metallic enclosure for housing an electrical de-

vice including an apertured, supporting end wall, an assembly for connecting a tubular conduit to the apertured end wall comprising in combination:

a tubular insert seated in the end wall aperture and including a non-circular flanged portion arranged to be seated in a non-circular recessed area of the inner wall surface of said supporting end wall to prevent rotation of said insert with respect to said enclosure, and having a portion extending in a longitudinal plane outwardly of said end wall;

a rotatable, hollow, internally threaded hub member having an aperture inturned end wall, said apertured end wall being received and supported by the externally extending portion of said tubular insert, and the distal end of said



extending portion being formed with a hub-retaining lip extending laterally relative to the longitudinal axis of said insert; a first washer member received by the externally extending portion of the tubular insert and seated between the inner surface of the apertured end wall of said hub member and said hub-retaining lip, and a second washer member received by the externally extending portion of the tubular insert and seated internally of the hollow hub between the hub-retaining lip of said tubular insert and the said first washer member, said first washer member being formed of a material having a relatively low coefficient of friction with respect to the material of said second washer member and the material of said inturned end wall of said hub member.

4,324,425

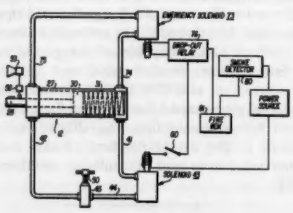
POINT-OF-EGRESS CONTROL DEVICE FOR SECURING EXIT DOORS SAFELY

Emanuel L. Logan, 9406 Flower Ave., Silver Spring, Md. 20901

Continuation-in-part of Ser. No. 877,893, Feb. 15, 1978, abandoned. This application Aug. 1, 1978, Ser. No. 929,968

Int. Cl.³ E05C *15/02*

U.S. Cl. 292—201 **37 Claims**



1. A latch for latching an emergency exit closure operable from inside of an enclosure and unlocked with respect to the inside of the enclosure comprising:

a bolt for latching the closure when the bolt is in a first position and for unlatching the closure when the bolt is in a second position;

means for prolonging over a time interval movement of the bolt from the first position to the second position to delay opening of the closure;

means for initiating running of the time interval upon attempting to open the closure from inside the enclosure, and

means responsive to an attempt to open the door for signaling that an attempt to open the door has occurred.

4,324,426

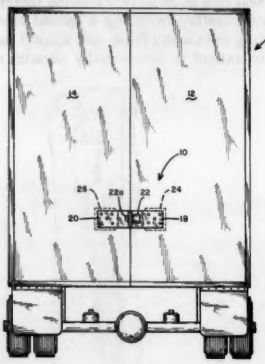
LOCK-PROTECTING HASP

Thorwald J. Michelson, Excelsior, Minn., assignor to Transportation Security, Inc., Eden Prarie, Minn.

Filed Mar. 10, 1980, Ser. No. 128,524

Int. Cl.³ E05C *19/08*

U.S. Cl. 292—281 **14 Claims**



1. A lock-protecting hasp for use on a stationary member and a movable member, the lock-protecting hasp comprising:

opposing aligned outside mounting hasps, each of said mounting hasps including a longitudinal member having a plurality of bolt holes, an angular member connected to the longitudinal member rising upward at a slight angle from said longitudinal member, and a vertical leg connected to said angular member, two elongated holes in said leg for accepting a shackle of a lock, a spacer member on each of said legs of said outside mounting hasp and including two aligned elongated holes for accepting said shackle of said lock, and a protector block affixed to a top of said spacer and running substantially the distance above said elongated holes whereby said shackle connects through each of said aligned holes of said aligned outside mounting hasps and said spacer thereby substantially protecting small space exposed between said shackle and said lock body of said legs of said outside mounting hasps and thereby securing said space between said shackle, said lock body, and said spacer by said protector block.

4,324,427

AUTOMOBILE BUMPER WITH ADIABATIC DEVICE

Vincent P. W. Huang, and Laurence P. Y. Huang, both of P.O. Box 22799, Taipei, Taiwan

Filed Jul. 3, 1980, Ser. No. 165,946

Int. Cl.³ B60R *19/02*

U.S. Cl. 293—106 **10 Claims**

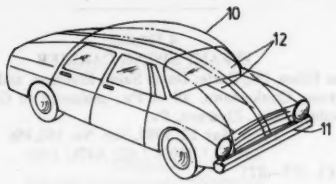
1. An automobile bumper comprising:

a supporting bracket having a substantially rectangular base for mounting on the front or rear side of the automobile;

a bracket casing mounted movably on said supporting bracket;

one or more adiabatic devices received movably in a space defined by said supporting bracket and said bracket casing; and

at least one buffer spring provided between said one or more adiabatic devices and said supporting bracket, wherein said one or more adiabatic devices comprises a plurality of stands, each supporting a winding shaft there-between, a roll of flexible adiabatic sheet wound on said winding shaft, and a reversing rotation means attached to one end



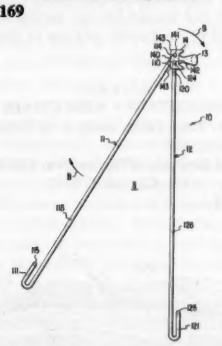
of said winding shaft for making the drawn-out flexible adiabatic sheet return to its original wound position when said adiabatic sheet is released, wherein each of said at least one buffer spring is separately supported by a pair of opposing stems, each opposing pair of stems being provided on one of said stands and on an opposing surface of said supporting bracket.

4,324,428

WOOD CARRIER

Gabriel J. Fieni, 31 Cedar La., Douglassville, Pa. 19518

Filed Dec. 27, 1979, Ser. No. 107,513
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—169 **20 Claims**



1. A device for carrying wooden logs and the like, comprising:

a. two wire frame means for containing the wooden logs and the like;

b. handle means for lifting the two wire frame means containing the wooden logs and the like;

c. flange means, rigidly connected to the handle means, for moving one wire frame means relative to the other wire frame means by rotation of said handle means; and

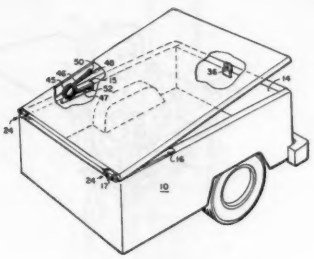
d. wherein said two wire frame means each have an upper shoulder and said flange means moves said one wire frame means relative to the other wire frame means when a bottom edge of the flange means contacts the upper shoulder of said one wire frame means.

4,324,429

QUICK DETACHABLE HINGING COVER FOR PICKUP TRUCK BEDS

Charles E. Wilson; Arnold W. Wilson, and Reginald H. Morley, all of Calgary, Canada, assignors to Sunwil Manufacturing Ltd., Alberta, Canada

Filed Apr. 1, 1980, Ser. No. 136,269
Int. Cl.³ B60P *7/02*
U.S. Cl. 296—100 **10 Claims**



1. A cover for a pickup truck bed having upstanding side walls, a front wall and a rear wall, said cover comprising:

a top of sufficient size to include edges resting on and overlapping the upstanding walls of the truck bed;

a pair of angle brackets fixed to said upstanding side walls at spaced positions adjacent one selected edge of said top, said angle brackets each including an upstanding member extending adjacent said selected edge and forming a first recess facing said top and a second recess facing away from said top;

a latch aligned with and cooperation with each angle bracket and fastened to said selected edge of said top to fasten said top to said upstanding side walls while allowing the top to be pivoted about said one selected edge to a raised and closed position, each latch including a flange fitting into said bracket first recess and also including a rod pivotally connected and movable to positions engaging and disengaging from said second recess to prevent movement of said top selected edge away from said latch while allowing the top to be pivoted about said latch; and

means fixed to said top and side walls at a position remote to said angle brackets and flanges and operable to lock said top to said side walls and prevent pivoting of said top about said one selected edge.

4,324,430

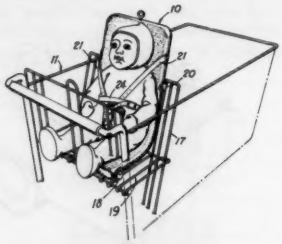
INFANT CARRIER PARTICULARLY FOR GROCERY STORE SHOPPING CARTS

Herman Dimas, Jr., and Janice E. Dimas, both of Box 694, Guernsey, Wyo. 82214

Filed Apr. 18, 1980, Ser. No. 141,646
Int. Cl.³ A47D *1/10*
U.S. Cl. 297—250 **2 Claims**

1. An infant carrier for the dual purpose of supporting an infant on the body and for supporting the infant in a safe sitting position in a shopping cart seat, said dual purpose carrier comprising a generally L-shaped substantially rigid support frame having the profile of a chair without legs and defining a comparatively short seat portion and a longer rising back portion, taut sheet material attached to said frame and providing support surfaces for an infant held in the carrier, a crotch flap attached to said sheet material at the seat portion of the carrier, first straps attached to opposite sides of the back portion of the carrier and adapted to be extended in crossed relationship forwardly and over the shoulders and chest of an infant seated in the carrier and adapted for connection releasably with said crotch flap, a second strap including portions attached to opposite sides of said back portion of the carrier

below the attachment points of the first straps and adapted to be releasably secured across the front of the torso of an infant seated in the carrier, whereby the infant is securely held against fore and aft movement, lateral movement and downward sliding movement in the carrier, a third strap including portions attached to opposite sides of the back portion of the carrier at an elevation between the first straps and second strap, the third strap adapted to be releasably fastened to a back portion of the shopping cart seat within which the infant carrier with the infant seated thereon can be bodily placed and removed, and a fourth strap including portions attached to opposite sides of the seat portion of the carrier and adapted to be releasably secured to an underlying seat portion of the shopping cart seat, whereby the back and seat portions of the carrier are firmly anchored to the corresponding portions of the shopping cart seat, and removable sling means attached to the carrier to enable supporting it with an infant seated therein on the body.

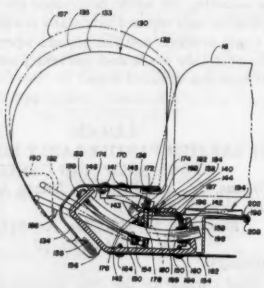


4,324,431

VEHICLE SEAT WITH INDIVIDUAL ADJUSTABLE FRONT THIGH SUPPORT

Randall T. Murphy, Farmington Hills, and Dennis H. Heling, Canton, both of Mich., assignors to Lear Siegler, Inc., Livonia, Mich.

Filed May 6, 1980, Ser. No. 147,409
Int. Cl.³ A47C *3/00, 7/02*
U.S. Cl. 297—284 **11 Claims**



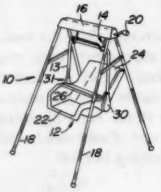
1. In combination with a vehicle seat having a back rest portion and a seating portion retained on a frame structure, an independently supported slidable bolster portion located adjacent to the front end of said seating portion and adapted to support the thighs of an occupant of said seat; at least one slideway fixedly connected to said frame structure for defining a slide path for the bolster portion to allow the bolster portion to extend from a fully retracted position to a fully extended position; and said bolster portion including at least one slide member slidably mounted on said slideway for slidably moving said bolster portion between said fully retracted and extended positions, wherein one of said slide member and said slideway includes a support shaft and a pair of spaced support flanges extending outwardly therefrom for supporting said support shaft therebetween and wherein the other of said slideway and said slide member includes a pair of interconnected spaced slide elements, said slide support shaft extending through apertures formed through the slide elements, said slide elements sliding on the slide support shaft to allow said bolster portion to move between said fully extended and retracted positions.

4,324,432

INFANT SWING CARRIER

James Eldon, III, Barto; David Saint, Elverson, and Thomas L. Latone, Quakertown, all of Pa., assignors to Graco Metal Products, Inc., Elverson, Pa.

Filed May 23, 1980, Ser. No. 152,956
Int. Cl.³ B60N *1/02*; A47C *1/00*
U.S. Cl. 297—377 **12 Claims**



1. Apparatus comprising:

(a) an infant carrier body, a generally U-shaped handle pivoted at its free ends to opposite sides of said body and with the handle bight being above and transverse of said body,

(b) latch means for latching said handle in at least two positions relative to said body, one of said positions being an operative position,

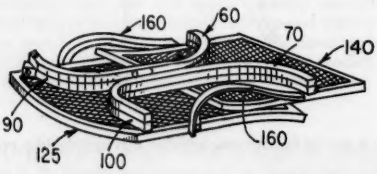
(c) a hanger for detachably coupling the handle bight to a swing when the handle is in its operative position, said handle bight and hanger having mating structure to prevent pivoting of the handle relative to the hanger.

4,324,433

KNOCKDOWN ARM CHAIR

Herbert C. Saiger, Troy, Ohio, assignor to Plantation Patterns, Inc., Birmingham, Ala.

Filed Dec. 13, 1979, Ser. No. 103,287
Int. Cl.³ A47C *4/02*
U.S. Cl. 297—442 **10 Claims**



1. A knockdown arm chair, comprising: a pair of double leg members each including two legs, two seat assembly supports and a connecting spacer all disposed in a generally common plane, said pair of double leg members adapted to interfit rigidly at right angles with said spacers in alignment; a seat assembly including a seat, a back and a pair of arms pivoted at the free ends respectively to the sides of said seat and said back; detachable means rigidly connecting the rear of said seat to said back and to adjacent seat assembly supports when said back is pivoted by said arms to operative position; and spaced

means at the bottom front of said seat for rigid attaching engagement of adjacent seat assembly supports of an interfitted pair of said double leg members; whereby said knockdown chair is readily and rigidly user-assembled by said rigid connecting means, and said seat and said back are movable into substantial alignment and said double leg members when separated may lie on said seat and back below the level of said arms thereby minimizing space required for packaging and storage.

4,324,434

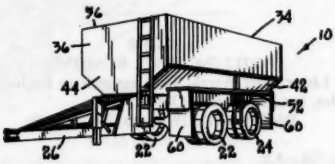
GRAIN CARRYING VEHICLE

Wayne G. Friese, Rte. 3, Box 150, Devils Lake, N. Dak. 58301

Filed Dec. 13, 1979, Ser. No. 103,366

Int. Cl.³ B60P *1/56*

U.S. Cl. 298—27 **8 Claims**



1. An improved vehicle suitable for carrying grain and other particulate materials, comprising:

a base frame including two laterally spaced, generally horizontal elongated support elements and an interconnecting member intersecting said laterally spaced support elements;

means mounting said frame for movement over the ground;

a carriage mounted to said frame and including a main body portion having a front wall, a rear wall, and two opposite side walls, each of said side walls including a planar portion extending obliquely with respect to the ground and upwardly and outwardly with respect to said body, and said carriage further including an open discharge portion extending downwardly from said main body portion between said support elements and spaced laterally from said interconnecting member and a lip forming a lower extremity of said discharge portion and defining a first plane, said discharge portion having formed therethrough a discharge aperture circumscribed by said lip providing communication between the interior of said main body portion and the exterior beneath said vehicle;

a pair of parallel and generally horizontal fender panels, one of said pair fixedly positioned beneath each of said obliquely disposed planar portions of said side walls;

a plate sized with respect to said discharge aperture such that it may completely obstruct said aperture, said plate having a closure surface engaging said lip of said discharge portion and a free surface;

a track having a bearing surface engaging said free surface of said plate to maintain said plate in a second plane parallel to said first plane and engaging said lip;

means for withdrawing said plate in said second plane along said track to open said discharge aperture; and

an acutely angled bracket, mounted to said vehicle, into which said plate wedges when moved to a positioned occluding said discharge aperture, said bracket having an oblique surface to urge said plate against said lip as said plate is moved in a direction toward said bracket.

4,324,435

LOCK ASSEMBLY FOR EARTHWORKING APPARATUS

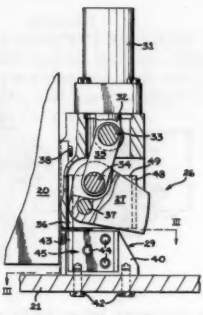
Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00536, § 371 Date May 8, 1980, § 102(e) Date May 8, 1980

PCT Filed May 8, 1980, Ser. No. 245,229

Int. Cl.³ A01B *15/20*

U.S. Cl. 299—37 **12 Claims**



1. In an earthworking apparatus (10) having an energy source (18) for activating an earthworking tool (19), a rotatable housing (20) for enclosing said energy source (18), a mounting assembly (21) for rotatably supporting said housing (20), and means for rotating said housing (20) relative to said mounting assembly (21), the improvement comprising:

a moveable lock member (27) mounted on said housing (20);

means (26) for locking said housing (20) to said mounting assembly (21) and preventing rotational motion, said means including a plurality of lock stations (28,39,30) disposed on said mounting assembly (21),

each block station (28, 29, 30) including first and second separate blocks (39, 40), said blocks (39, 40) each being connected to said mounting assembly (21) and spaced a preselected distance ("d") one from the other and defining an opening (41) having a longitudinal axis and being of a preselected size ("d"), said opening size ("d") being adapted to receive said lock member (27) for unrestrained movement of the lock member (27) along the longitudinal axis of the opening (41) and restrain movement of the lock member (27) in directions transverse to said longitudinal axis in the activation position of said earthworking tool; and

means (31) for moving said lock member (27) in and out of locking engagement with said lock stations (28,29,30).

4,324,436

AUTOMATIC LOAD-DEPENDENT BRAKING-FORCE CONTROL DEVICE

Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,683

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907425

Int. Cl.³ B60T *8/22*

U.S. Cl. 303—22 R **4 Claims**

1. An automatic load-dependent braking-force control device for fluid pressure actuated brake systems in motor vehicles or trailers and comprising:

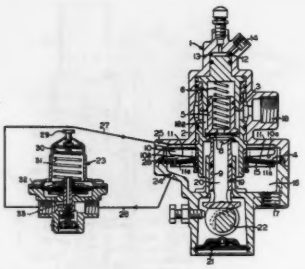
(a) a brake-pressure control piston assembly subjectable to brake control pressure and including a control piston and a flexible diaphragm secured thereto for axial movement therewith,

(b) a dual function valve body cooperating alternatively

with a supply valve seat to form a supply valve assembly and with an exhaust valve member to form an exhaust valve assembly,

(c) said control piston having an upper pressure surface subjectable to brake control pressure of a brake-pressure transmitter via a control chamber and a fluid pressure control port,

(d) said diaphragm having a lower pressure surface adjacent a brake-pressure delivery chamber communicating with



and for delivering wheel brake cylinder pressure to a delivery port,

(e) the degree of brake pressure delivered to said delivery port being determined via a cam element positionable according to vehicle weight, and wherein the improvement comprises:

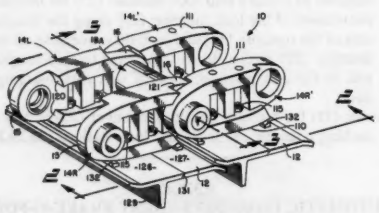
(f) a pressure-limiting valve device via which the brake-pressure delivery chamber situated below the diaphragm of said brake-pressure control piston assembly is connected with a supply chamber situated above said diaphragm.

4,324,437

ENDLESS TRACK

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

Filed May 12, 1978, Ser. No. 905,209
Int. Cl.³ B62D *55/20*
U.S. Cl. 305—11 **25 Claims**



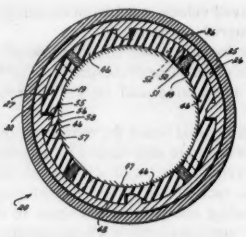
1. A track assembly comprising a first pair of transversely spaced track links having aligned bores and counterbores in the front ends of their axially inner sidewalls, a second pair of transversely spaced track links having their back ends respectively proximately overlapping the inner sidewalls of said front ends of said first link pair, said back ends of said second link pairs having holes therethrough in assembled coaxial alignment with said bores and counterbores in said first link pair, and a pivot assembly articulately to interconnect said first and second link pairs, said pivot assembly including coupling means extending through said holes, bores and counterbores of the respective interconnected link pairs to permit said first link pair concurrently to pivot relative to the freely concurrently pivoting second link pair and to maintain said first and second link pairs in generally parallel axially spaced relationship, said coupling means including a pivot pin extending through said holes in said second link pair and said counterbores of said first link pair into said bores of said first link pair with the opposite ends of said pivot pin being connected to said track links of said first link pair commonly to pivot therewith, metal insert means positioned in said counterbores to resist wear and to permit independent selective replacement thereof when worn, a bushing having a bore through which the relatively movable pivot pin of a smaller diameter passes and portions received in and secured to said holes in said track links of said second link pair for common pivotal movement therewith, the ends of said bushing projecting into said counterbores in said link pair but being freely pivotable relative thereto and bearing against said metal insert means to maintain the proper spacing between the overlapped adjacent ends of the track links of said first and second link pairs, metal inserts in the bore in said bushing at opposite ends thereof, said metal inserts being selectively replaceable as required by wear, metal sleeve means extending axially circumferentially around said bushing to resist wear and to permit independent selective replacement thereof when worn, said sleeve means being press fitted on said bushing and forming at its ends shoulder means bearing against the axially inner sidewalls of said link pair to maintain the proper spacing therebetween.

4,324,438

DRILLING DECK BUSHING

Roy D. Lister, Fort Worth, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 13, 1980, Ser. No. 206,686
Int. Cl.³ F16C *31/02*
U.S. Cl. 308—3.5 **6 Claims**



1. A bushing for the deck of a drilling rig comprising,

an outer shell,

an inner shell mounted for rotation within said outer shell,

an elastomeric bushing mounted within said inner shell,

said bushing being formed of a plurality of arcuate segments which together present a generally cylindrical inner surface for engagement with a circular pipe,

abutment means between said bushing and said inner shell blocking rotation of said bushing with respect to said inner shell.

4,324,439

ANTI-RACK SYSTEM FOR WIDE DRAWERS AND THE LIKE

Magnus F. Hagen, Laguna Beach, and Richard O. Rask, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Jan. 10, 1980, Ser. No. 111,121
Int. Cl.³ F16C *29/04*
U.S. Cl. 308—3.8 **7 Claims**

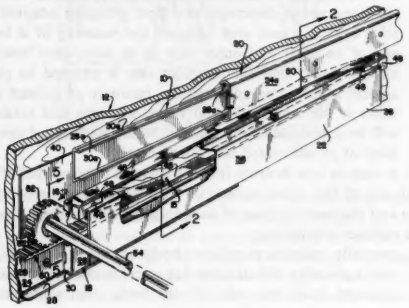
1. An anti-racking apparatus for wide drawers and the like supported within a cabinet structure comprising a pair of slide-suspension mechanisms, each being oppositely positioned on each side of said drawer, wherein each mechanism includes:

a first lower slide unit fixedly mounted to said cabinet struc-

ture, wherein said lower slide unit comprises an outer slide member fixedly secured to said cabinet structure, an inner slide member movably supported within said outer slide, and bearing means interposed therebetween;

a second upper slide unit mounted to the side of said drawer and movable therewith, wherein said upper slide unit comprises an outer slide member fixedly secured to said drawer, an inner slide member movably supported within said outer slide member thereof, and bearing means interposed between said outer and inner slide members;

an intermediate member interconnecting said lower and upper slide units together;



a synchronizing means interconnected between said lower and upper slide units to control the relative linear movement therebetween, wherein said outer units of said upper and lower slide units are interconnected by said synchronizing means, and said inner units thereof are interconnected and movable with said intermediate member; and

a stabilizing means mounted between said opposing pair of said slide suspension means to establish a parallel linear motion therebetween.

said stabilizing means is operably interconnected to each oppositely disposed intermediate member.

4,324,440

CONTAINING BEARING FOR SUPERCRITICAL ROTORS

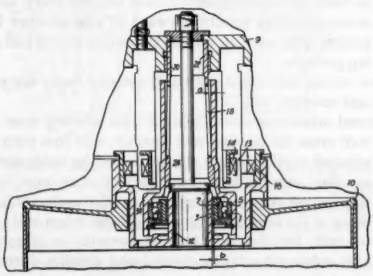
Richard Steigenberger, Friedberg, and Dieter Hirt, Augsburg, both of Fed. Rep. of Germany, assignors to MAN Maschinenfabrik Augsburg Nurnberg, Munich, Fed. Rep. of Germany

Filed Jun. 11, 1980, Ser. No. 158,622

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924815

Int. Cl.³ F16C *27/04*

U.S. Cl. 308—26 **10 Claims**



1. A containing bearing for a supercritical rotor which surrounds the rotor is adapted to stabilize the rotor in the presence of radial rotor vibrations, a gap is present between the containing bearing and the rotor, said gap being of a size equal to or larger than the maximum amplitude of vibration of the rotor in normal operation, wherein: an outer race (**5**) of the containing bearing (**1**) is supported by an oblong, resilient sleeve (**20**) which extends coaxially to and in extension of the rotor (**10**) and is further defined by having its far end (**22**) fixed to prevent its rotation.

4,324,441

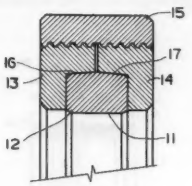
ROLLING CONTACT ELEMENT

William S. Rouverol, 1331 Arch St., Berkeley, Calif. 94708, and Robert C. Krumme, 446 Forest Ave., Palo Alto, Calif. 94301

Filed Oct. 24, 1980, Ser. No. 200,373

Int. Cl.³ F16C *33/58*

U.S. Cl. 308—177 **26 Claims**



1. A pair of bodies, one of which is mounted to roll on the other,

one of said pair being composed of at least two parts, including a first part that has a surface in rolling contact with the other of said pair and at least one additional part that applies to said first part forces that induce at the point of contact of said bodies compressive stress on a first plane normal to said surface at said point,

said compressive stress being greater than one-fourth the yield point stress in simple tension for the material of said first part.

4,324,442

DEVICE FOR SUPPLYING AN OIL-AIR MIXTURE TO BEARING LOCATIONS

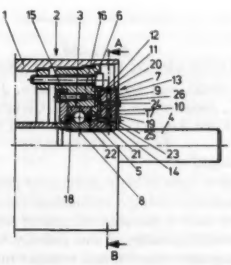
Horst G. Schrecke, Dittelbrunn, and Hermann Glöckner, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,438

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 7906703[U]

Int. Cl.³ F16C *33/66*

U.S. Cl. 308—187 **10 Claims**



1. In a device for supplying an oil-air mixture to a bearing location from an oil reservoir, arranged on a shaft, in which the

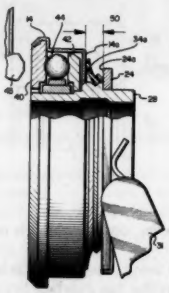
oil is held by an absorbent and retentive material, the combination comprising said oil reservoir being in a bore of a revolving machine part and including a closed annular container filled with an absorbent and retentive material, fixed next to the bearing to be lubricated on a shaft and provided with substantially radial passages opening at the periphery thereof into a space communicating with one side of the bearing and at the bore thereof into grooves in communication with the other side of the bearing.

4,324,443

SEALED THRUST BEARING ASSEMBLY

Richard T. Dagiel, Elkgrove Village, Ill., assignor to Aetna Bearing Company, Chicago, Ill.

Filed Jan. 3, 1980, Ser. No. 109,224
Int. Cl.³ F16C *33/78*
U.S. Cl. 308—187.1 **8 Claims**



1. A sealed thrust bearing assembly, comprising: a bearing member comprising first and second spaced apart, oppositely disposed annular thrust rings, a plurality of bearing elements rotatably retained therebetween, a generally annular shell member for holding said spaced apart thrust rings in a fixed axial spaced relation to one another while permitting relative rotation therebetween about a common axis, a carrier plate having a face portion extending transversely of said axis and presented toward a facing surface of said shell, said plate having a generally circular opening, a generally cylindrical carrier member projecting through said opening and said bearing member to effectively hold the carrier plate and bearing member in assembled relation, a generally annular, elastomeric sealing member interposed between said face portion and said facing surface and being in sealing engagement with the facing surface and with the assembled carrier plate and carrier member, said sealing member being shaped to yield as the spacing of said face portion and said facing surface varies due to wear or the like while at the same time maintaining said sealing engagement.

4,324,444

SNAP-IN BEARING RETAINER AND BEARING

Neal J. Buczynski, and Edward W. Kern, Jr., both of Jamestown, N.Y., assignors to TRW Inc., Cleveland, Ohio

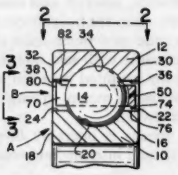
Filed Aug. 11, 1980, Ser. No. 176,885
Int. Cl.³ F16C *33/38*
U.S. Cl. 308—201 **6 Claims**

3. In a snap-in type of bearing retainer adapted for use with a bearing assembly having a cylindrical outer race, a cylindrical inner race and a plurality of spaced apart ball members disposed circumferentially of and radially between said inner and outer races and wherein said retainer includes a generally cylindrical retainer body having a plurality of ball receiving pockets extending axially outward from one side thereof with at least some of said pockets having outermost entrance areas defind by finger-like members which are yieldable to accommodate capture of an associated ball member therein, the improvement comprising:

a web area interposed between each of said ball receiving pockets circumferentially of said retainer body, said web areas extending axially outward of said retainer body a greater distance than said pocket entrance areas; a first pilot rim disposed circumferentially of said retainer body and extending in at least one radial direction therefrom; and, a second pilot rim defined by arcuate pilot rim segments associated with said web areas circumferentially of said retainer body, said segments radially extending from said web areas at least the direction opposite to said at least one radial direction, said first pilot rim adapted to pilot against a land area adjacent the raceway of at least one of an inner and outer race in an associated bearing assembly and said second pilot rim is adapted to pilot against a land area adjacent the raceway of at least the other of the inner and outer races, whereby said retainer will be controlled and stabilized during high speed operations of an associated bearing assembly.

6. A snap-in type bearing retainer adapted to be piloted off at least one of the outer surface of an associated inner bearing race and the inner surface of an associated outer bearing race, said retainer comprising:

a generally cylindrical retainer body having a longitudinal axis, a plurality of ball receiving pockets extending axially outward from one side of said body circumferentially



therearound at substantially equidistantly spaced intervals, said pockets each including a pocket entrance area opening axially outward generally parallel to said axis and being defined between opposed outwardly yieldable fingers having outermost finger ends generally facing each other in a spaced apart relationship which is less than the maximum width of the associated pocket;

a web area interposed between at least selected ones of said pockets circumferentially of said retainer body, said web areas extending axially outward of said retainer body a greater distance than the entrance areas of said ball receiving pockets;

first means associated with said retainer body for piloting said retainer; and,

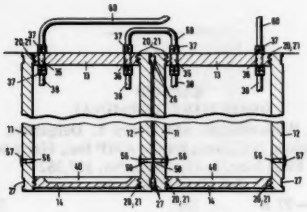
second means associated with at least selected ones of said web areas for piloting said retainer, said first pilot means adpated to pilot against at least one of the inside surface of an outer race and the outside surface of an inner race and said second pilot means adapted to pilot against at least the other of the outside and inside surfaces when said retainer is axially installed on a bearing assembly in order to provide enhanced retainer control and stability during high speed operation of the bearing assembly; and,

wherein a web area is interposed between each of said ball receiving pockets, said second pilot means comprising an arcuate rim segment associated with each of said web areas and extending radially of said body.

4,324,445
REFRIGERATING OR WARMING CABINET

Rudolf Schaefer, Brauerstr. 35, 4100 Duisburg 1, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,604
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843972
Int. Cl.³ A47B 77/08; F16B 12/00
U.S. Cl. 312—236 6 Claims

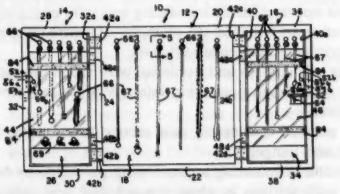


1. The combination of a refrigeration or warming cabinet with a detachably connected wall assembly formed of single flat wall elements coupled in connecting areas by connecting elements cooperating with one another to form groove-tongue connections; at least one wall element having on the front side a first type of connecting element and on a side surface a second type of connecting element; one of the connecting element types being a groove of approximately trapezoidal cross section and the other of the connecting element types being a tongue of approximately trapezoidal cross section; said first and second types of connecting elements running continuously along the wall elements such that in corner zones first and second types of connecting elements on the side surfaces of one of said wall elements merge into respective second and first type of connecting elements on the front side of another of said wall elements; the combination further comprising two clamping bands encircling the cabinet and holding together the flat wall elements and a releasable lock connected to said clamping bands for tightening each clamping band.

4,324,446
JEWELRY CASE

George J. LeSage, 12 Portland St., South Lawrence, Mass. 01843

Filed Jun. 19, 1980, Ser. No. 160,950
Int. Cl.³ A47F 5/08; A47B 67/02; B65D 25/10, 5/52
U.S. Cl. 312—245 6 Claims



1. A jewelry case for receiving, storing, carrying and displaying jewelry in spaced hanging relationship comprising:

a back member having a plurality of walls extending outwardly therefrom, and defining a first compartment therebetween,

a front member hingedly mounted to said back member and having a plurality of walls extending outwardly therefrom and defining a second compartment therebetween similar to said first compartment,

a plurality of pins mounted in each said compartments and extending outwardly therefrom to receive jewelry in spaced hanging relationship,

a first transparent member adjacent said first compartment and having hinge means attaching said transparent member to allow said transparent member to swing from closed to open relationship with said compartment,

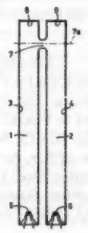
a second transparent member adjacent said second compartment and having hinge means attaching said second transparent member to allow said second transparent member to swing from closed to open relationship with said second compartment, and

resilient means disposed in spaced relationship upon said first and second transparent means and adjacent said first and second compartments respectively to contact said jewelry in each said compartments when said transparent members are in closed relationship with said respective compartments whereby said jewelry is retained in spaced hanging relationship free from mixed-up and tangled relationship.

4,324,447
METHOD OF PRODUCING A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Rein W. van der Wolf, and Cornelis J. van den Broek, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,284
Claims priority, application Netherlands, Apr. 3, 1979, 7902571
Int. Cl.³ H01J 9/26
U.S. Cl. 316—17 4 Claims



1. A method of producing a low-pressure mercury vapor discharge lamp comprising two or more substantially parallel co-extending glass discharge tubes, the discharge spaces of two adjacent discharge tubes being interconnected by a cross coupling extending substantially transversely to the wall of those discharge tubes, during operation of the lamp the discharge passing through the greater part of the discharge tubes, in which method the inner wall of each discharge tube is first coated with a luminescent layer and sealed at one end, characterized in that after application of the luminescent layer to the inner wall of the discharge tube, the connection between adjacent discharge tubes is effected in a gas-tight manner by making an aperture, having an outwardly-extending collar, in the wall of each of the tubes, by thereafter placing the apertures opposite one another and by thereafter fusing the collars together to form said cross coupling.

4,324,448

CIRCUIT BOARD WITH PLUG CONNECTOR

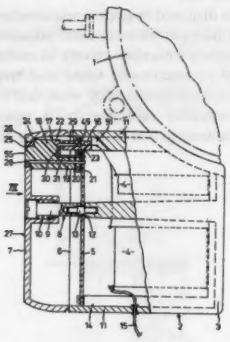
Herbert Palloch, Schwetzingen, and Hans Erndt, Wiesloch, both of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co. KG, Fabrik für Elektromotoren u. elektrische Apparate, Schwetzingen, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,892

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913937

Int. Cl.³ H05K *1/00*

U.S. Cl. 339—17 C 12 Claims



1. A circuit board arrangement disposed in a housing closable by a cover, the combination comprising a coupling element attached to the housing, a circuit board having a main planar surface, a plug connector having a plurality of plug prongs for electrical connection of circuitry disposed on the circuit board to said coupling element, the plug connector being secured on a rim portion of the circuit board and on the side of said circuit board oriented towards said cover, said plug connector comprising an insulating body formed with plug sockets in which said plug prongs are respectively mounted, said plug prongs extending substantially perpendicular to said main planar surface of said circuit board, said plug sockets opening towards an outer face of said plug connector remote from said circuit board, and said outer face of said plug connector being located in an opening in said cover.

4,324,449

NOISE REDUCTION CONNECTORS

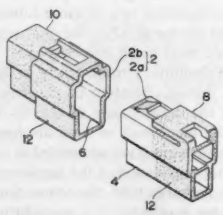
Mitsugu Watanabe, Numazu, and Tomoyuki Hirano, Cotenba, both of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 96,073, Nov. 20, 1979, abandoned, which is a continuation of Ser. No. 870,572, Jan. 18, 1978, abandoned. This application Dec. 17, 1980, Ser. No. 217,492

Claims priority, application Japan, Jan. 28, 1977, 52-7658

Int. Cl.³ H01R *13/62, 3/00*

U.S. Cl. 339—91 R 9 Claims



1. A connector structure comprising a female connector and a male connector, said female connector having a cavity and said male connector having a projecting portion slidably received within said cavity and retained therein to form a unitary connector structure, the exposed outer surfaces of said female connector and said male connector being coated with a thin dried adhesive film having embedded therein and projecting therefrom a multitude of fibers having a length of from 0.3 to 3 mm and having a thickness of from 1.5 to 30 denier, said fibers being selected from the group consisting of nylon, rayon and cotton, said fibers forming an integral uniform noise-reducing layer on the exterior surface of said connector structure.

4,324,450

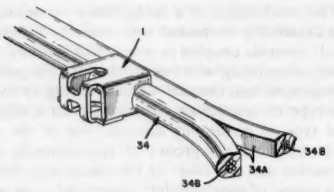
DROP WIRE TERMINAL

Lawrence P. Weisenburger, and Henry L. Delguidice, both of Winston-Salem, N.C., assignors to AMP Inc., Harrisburg, Pa.

Filed Mar. 5, 1980, Ser. No. 127,282

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—97 R 7 Claims



1. A terminal for electrical connection to a stranded wire conductor, the terminal being stamped and formed from a single metal blank and comprising:

a first terminating section formed with a first bight section interconnecting a pair of opposed first plate portions bent outwardly from said first bight section,

said pair of first plate portions having aligned open ended slots, the sides of which define opposed insulating slicing and wire engaging jaws spaced apart a distance less than the diameter of a wire conductor to be engaged between said jaws,

a second terminating section opposed from said first terminating section, said second terminating section being formed with a second bight section interconnecting a pair of opposed second plate portions bent outwardly from said second bight section and spaced farther apart than said first plate portions, said second plate portions being provided with aligned open ended slots the sides of which define opposed insulation slicing and wire engaging jaws, spaced apart less than the diameter of a wire conductor to be terminated between said jaws,

a flange adjacent to and coplanar with said first bight section, said flange projecting laterally aside said first plate portions,

a web portion connecting said second terminating section with said flange,

said second terminating section being pivotable by bending said web portion to close toward said first terminating section and said flange, so that said slots of said first and said second plate portions are brought into alignment and simultaneously receive a wire conductor therein and establish electrical connection thereto,

said flange providing a stop against which said second plate portions engage to limit pivoting of said terminating sections relative to each other, and

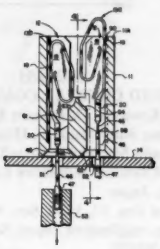
said web portion having one or more bends therein, initially positioning said second terminating section partially closed toward said first terminating section.

4,324,451

CARD EDGE CONNECTOR WITH PULL THROUGH BELLOWS CONTACT AND LAY-OVER INSULATOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, Tex., and Richard O. Norman, Oxnard, Calif., assignors to Elfab Corporation, Dallas, Tex.

Filed Nov. 19, 1979, Ser. No. 95,226
Int. Cl.³ H01R *9/09, 13/42*
U.S. Cl. 339—176 MP **2 Claims**



1. A printed circuit card edge electrical connector assembly adapted for structural mounting on a substrate having contact receiving apertures therein, said electrical connector assembly comprising:

an insulative block having a top and a bottom, said insulative block comprising:

interior walls defining a plurality of sleeves formed through said insulative block, said sleeves having a substantially unobstructed region which is open at the top and bottom portions thereof;

a first pair of parallel, laterally spaced alignment troughs in each said sleeve adjacent the substantially unobstructed region through said said insulator;

each said first pair of troughs defining a first alignment track, said first track being open at both ends and being substantially shorter than said sleeves, said first track having its lower termination portion near the bottom of the insulator and its lead in portion substantially beneath the top of the insulator; and a second pair of parallel, laterally spaced alignment troughs in each said sleeve adjacent the substantially unobstructed region through said insulator;

each said second pair of troughs defining a second alignment track, said second track being open at both ends and being substantially shorter than said sleeves;

contacts receivable in secure axial alignment into the sleeves of said insulative block, said contacts including:

a lower tail portion;

an intermediate mounting portion;

an upper contactor region comprising a loop portion which has a substantially elliptical-shaped torroidal cross section, the major axis of which extends longitudinally to the contact axis, said loop portion being compressable along its minor axis for reliable electrical engagement between the front portion of said loop and a printed circuit card edge to be connected and wherein the plane of the rear portion of said loop lies generally parallel to the plane of the intermediate and tail portions of the contact and is postitionable flush against the inside of the outer walls of said insulator sleeves;

a first laterally disposed projection comprising a first pair of transversely extending ears, said first ears being formed as an integral portion of said intermediate mounting portion, said first projection being in general axial alignment with said lower tail portion and extendable into and receivable in sliding engagement with said first alignment track;

a second laterally disposed projection comprising a second pair of transversely extending ears said second ears being formed as an integral part of the rear portion of the loop of said upper contactor region, said second projection being extendable into and receivable in sliding engagement with said second alignment track; and

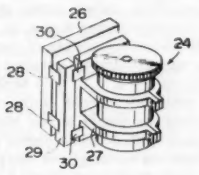
whereby the axial alignment of said contact relative to said sleeve is securable by sliding engagement of said first and second projections with said first and second alignment tracks, respectively, said contacts being movable longitudinally within the substantially unobstructed region of said sleeve for structurally mounting the intermediate portions thereof in the contact receiving apertures in the substrate.

4,324,452

LIGHT BEAM SCANNING SYSTEM WITH MOTOR AND VIBRATION ISOLATING MEANS

Masaru Noguchi; Shigenori Oosaka, and Tsuneo Komura, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 9, 1980, Ser. No. 167,227
Claims priority, application Japan, Jul. 13, 1979, 54-96570[U]
Int. Cl.³ G02B *27/17, 7/18;* **H02K** *5/24*
U.S. Cl. 350—6.7 **8 Claims**



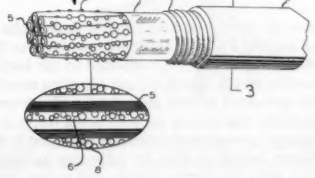
1. In a light beam scanning system, comprising a light beam scanner including a high-speed motor and a rotating mirror driven by the high-speed motor, said light beam scanner being mounted on a mounting plate, and vibration isolating means for preventing vibration of the light beam scanner from being transmitted through said mounting plate, the improvement wherein said vibration isolating means comprises a bracket for holding said light beam scanner, an intermediate member disposed between said mounting plate and said bracket, and spring means disposed between said mounting plate and said intermediate member, and between said intermediate member and said bracket, for holding said mounting plate, said intermediate member and said bracket together while maintaining vibration isolation therebetween.

4,324,453

FILLING MATERIALS FOR ELECTRICAL AND LIGHT WAVEGUIDE COMMUNICATIONS CABLES

Naren I. Patel, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Feb. 19, 1981, Ser. No. 235,922
Int. Cl.³ B32B *17/00;* **G02B** *5/16;* **H02G** *15/20*
U.S. Cl. 350—96.23 **4 Claims**



1. A communications cable comprising a plurality of con-

ductors arranged to define a plurality of interstices therebetween, a jacket circumferentially surrounding said conductors, and a filling material filling at least a portion of such interstices, said filling material being comprised of styrene block copolymer rubber, mineral oil and inorganic hollow microspheres, wherein:

(a) the amount and type of said block copolymer rubber is either:

(i) 1 to 30 percent by weight of styrene-ethylene-butylene-styrene block copolymer having a styrene to rubber ratio of approximately 0.4 and a specific gravity of approximately 0.9;

(ii) 7 to 10 percent by weight of styrene-butadiene-styrene block copolymer having a styrene to rubber ratio of approximately 0.39 and a specific gravity of approximately 0.94; or

(iii) 8 to 12 percent by weight of styrene-isoprene-styrene block copolymer having a styrene to rubber ratio of approximately 0.16 and a specific gravity of approximately 0.92;

(b) wherein said mineral oil is either:

(i) 60 to 80 percent by weight of paraffinic mineral oil having a viscosity-gravity constant (ASTM D 2501-67) of approximately 0.78 to 0.85 with a minimum of 65 percent paraffinic carbon atoms and a maximum of 5 percent aromatic carbon atoms; or

(ii) 60 to 80 percent by weight of naphthenic mineral oil having a viscosity-gravity constant (ASTM D 2501-67) of approximately 0.78 to 0.85 with a minimum of 35 percent naphthenic carbon atoms and a maximum of 5 percent aromatic carbon atoms; and

(c) said inorganic hollow microspheres are either:

(i) 1 to 20 percent by weight of inorganic hollow microspheres made from glass, having a particle diameter between 10 and 200 microns and a particle density range of approximately 0.1 to 0.3 g/cm^3; or

(ii) 1 to 35 percent by weight of inorganic hollow microspheres made from ceramic materials, having a particle diameter between 60 and 325 microns and a particle density of approximately 0.6 g/cm^3.

4,324,454

ELECTRIC MIRROR ANGLE ADJUSTING DEVICE

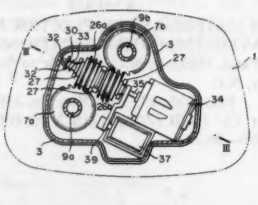
Toshiyuki Kumai, Fujieda, Japan, assignor to Murakami Kaimeido Co., Ltd., Shizuoka, Japan

Filed Sep. 20, 1979, Ser. No. 77,390

Claims priority, application Japan, Sep. 27, 1978, 53-131658[U]; May 26, 1979, 54-070195[U]

Int. Cl.^{3} G02B *7/18*

U.S. Cl. 350—289 **3 Claims**



1. An electric mirror angle adjusting device characterized by one end each of a pair of adjusting members for the adjustment of the mirror angle being attached to the back side of a mirror pivotally and unrotatably, said adjusting members being respectively provided around their roots with curved surfaces with projections, said curved surfaces being respectively fitted in round sliding surfaces with concaves provided in the central holes of worm wheels so that the adjusting members respectively rotate with the worm wheels and swing conically on their roots, adjusting nuts with catches holding the threaded portions of the adjusting members in between and being disposed coaxially with the adjusting members respectively, said worm wheels being in meshing contact with worm gears, a slide cylinder being axially slidably fitted in the worm gears, projections provided on the periphery of the slide cylinder being adapted to be selectively engaged with either of the worm gears, said slide cylinder being connected with the output shaft of a reversible motor and adapted to be axially moved by the plunger of a solenoid.

4,324,455

LIQUID CRYSTAL COMPOSITION

Seiichi Imahori, Kawasaki; Masaharu Kaneko, Yamato; Hitoshi Ono, Yokohama; Shuji Imazeki, Hitachi; Akio Mukoh, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Hitachi Ltd., both of Tokyo, Japan

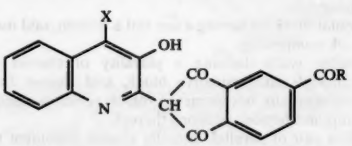
Filed Sep. 11, 1980, Ser. No. 186,043

Claims priority, application Japan, Sep. 11, 1979, 54/116313; May 7, 1980, 55/60150

Int. Cl.^{3} C09K *3/34;* G02F *1/13*

U.S. Cl. 350—349 **11 Claims**

1. A liquid crystal composition containing at least one quinophthalone series dye represented by the formula



wherein: X represents hydrogen, a chlorine atom or a bromine atom; and R represents —OR^1 or —SR^1, wherein R^1 represents an alkyl group, a cycloalkyl group, an alkoxyalkyl group, a phenyl group, a p-hydroxyphenyl group, a p-cycloalkylphenyl group, a p-alkylphenyl group, a p-alkoxyphenyl group or an aralkyl group;

wherein R^2 and R^3 each represents hydrogen, an alkyl group, a hydroxyalkyl group, an alkoxyalkyl group, a cycloalkyl group, a phenyl group, a p-alkylphenyl group, a p-hydroxyphenyl group, a p-alkoxyphenyl group or an aralkyl group; or a saturated heterocyclic ring.

4,324,456

ELECTROPHORETIC PROJECTION DISPLAY SYSTEMS

Andrew L. Dalisa, Cupertino, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

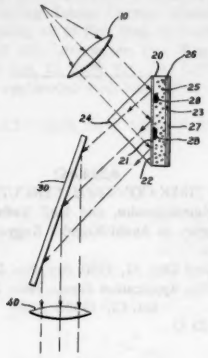
Filed Aug. 2, 1979, Ser. No. 63,214

Int. Cl.^{3} G02F *1/01*

U.S. Cl. 350—362 **17 Claims**

1. An electrophoretic projection display system comprising a light source, means for collimating light from said light source, total internal reflecting means receiving collimated light from said collimating means for totally reflecting said

light, electrophoretic means associated with said total internal reflecting means for controlling total reflection of said light,



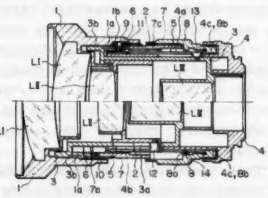
means for projecting the reflected light, and viewing means for viewing the projected light.

4,324,457

MACRO PHOTOGRAPHIC CHANGE-OVER DEVICE FOR ZOOM LENS BARREL

Yasumasa Tomori, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1980, Ser. No. 132,714
Claims priority, application Japan, Apr. 4, 1979, 54/40723
Int. Cl.³ G02B *7/10, 15/18*
U.S. Cl. 350—430 **8 Claims**



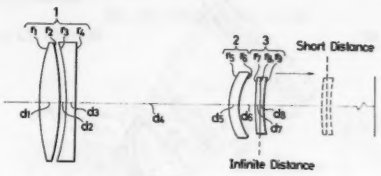
1. A zoom lens comprising: a plurality of lens groups; a focusing barrel and a zooming barrel rotatable independently from one another; a cam sleeve for controlling movement of at least predetermined ones of said lens groups for zooming and close-up photographing; a guide ring operatively cooperating with said focusing barrel wherein information of only one rotational position indicative that change-over to a close-up photographing mode is possible is exchanged between said guide ring and said focusing barrel; and a change-over sleeve cooperating with said zooming barrel for zooming; said focusing barrel, said cam sleeve, said guide sleeve and said change-over sleeve cooperating such that after changing to said close-up photographing mode said change-over sleeve is prevented from rotating whereby the rotation of said guide ring and rotation of said focusing barrel are prevented while simultaneously cooperation between said zooming barrel and said change-over sleeve is released to thereby enable said zooming barrel to rotate for said close-up photographing mode.

4,324,458

TELE-OBJECTIVE LENS WITH A MOVABLE SUB-GROUP FOR FOCUSING

Yasuhisa Sato, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 870,228, Jan. 17, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 136,086
Claims priority, application Japan, Jan. 20, 1977, 52-5182
Int. Cl.³ G02B *9/60, 9/34*
U.S. Cl. 350—454 **7 Claims**



1. A tele-objective lens, with a movable sub-group for focusing, comprising:

a positive lens group, consisting of one positive lens and one negative lens spaced from each other, and the curvature of the frontmost lens surface thereof being stronger than that of the rearmost lens surface, and

a negative lens group, being located axially in the image side of said positive lens group and consisting of a stationary meniscus lens and a movable sub-group for focusing;

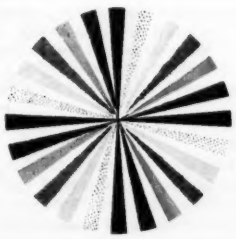
said stationary meniscus lens facing with its concave surface toward said movable sub-group, and said movable sub-group including positive and negative lenses; and wherein, when the focal length of the whole system is F and the focal length of said movable sub-group is F_3, said tele-objective lens satisfies the condition of $0.7F < |F_3| < 1.3F$.

4,324,459

OPTICAL TEST PATTERN

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 24, 1980, Ser. No. 114,866
Int. Cl.³ A61B *3/02*; G01M *11/00*
U.S. Cl. 351—32 **2 Claims**



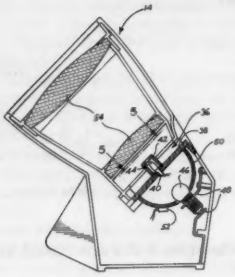
1. An optical test pattern having wedge-shaped regions in a predetermined arrangement, wherein each of said regions is of uniform optical density but wherein different regions are of different optical densities.

4,324,460

METHOD AND APPARATUS FOR TESTING FLICKER FUSION FREQUENCY

Michael L. Daley, 9345 SW. Westhaven Dr., Portland, Oreg. 97225

Filed Apr. 18, 1980, Ser. No. 141,303
Int. Cl.[3] A61B 3/02, 3/00
U.S. Cl. 351—36 4 Claims



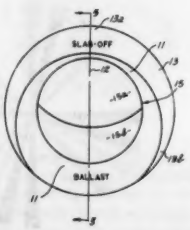
1. Apparatus for testing temporal vision comprising,
a viewing area,
means for producing a target light on a portion of said area,
means for producing background light on substantially all of said area,
target-defining means for defining a boundary which provides a viewably distinct separation between said target light and said background light,
first oscillator means operatively connected to said target-light producing means, said oscillator means being operative to switch said target light between a condition of full illumination and a condition of no illumination,
second oscillator means operatively connected to said background-light producing means, said second oscillator means being operative to switch said background light between a condition of full illumination and a condition of no illumination, and
a frequency control, operatively connected to said first oscillator means, operative to selectively vary the rate of switching of said target light.

4,324,461

CONTACT LENS FOR NON-ROTATIONAL ORIENTATION

Anthony L. Salvatori, Sarasota, Fla., assignor to Salvatori Ophthalmics, Inc., Sarasota, Fla.

Filed Nov. 26, 1979, Ser. No. 97,503
Int. Cl.[3] G03B 21/46
U.S. Cl. 351—160 H 5 Claims



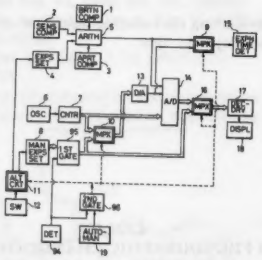
1. A contact lens for non-rotational orientation in the eye of a wearer, comprising a substantially circular lenticular carrier having a central concentric optical portion surrounded by a generally annular non-visual portion, and said non-visual portion having a thicker part at the lower part of said lenticular carrier when in the eye of a wearer and having a thinner part at the upper part of said lenticular carrier when in the eye of a wearer, there being no additional prism in the optical lens area.

4,324,462

EXPOSURE TIME CONTROL CIRCUIT FOR CAMERA

Eiichi Tano, Kamifukuoka, and Koji Suzuki, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,858
Claims priority, application Japan, Nov. 13, 1979, 54-146953
Int. Cl.[3] G03B 7/08
U.S. Cl. 354—23 D 9 Claims



1. An exposure time control circuit for a camera comprising:
arithmetic operation circuit means coupled to receive signals representing object brightness, film sensitivity, aperture value and exposure factor logarithmic compression values for calculating an automatic exposure time;
manual exposure time setting means for producing digital data corresponding to a manually set exposure time;
detecting means for detecting when an electronic flash is ready for operation, said detecting means providing a first signal when said electronic flash is ready and a second signal when said electronic flash is not ready;
an automatic-manual change-over means for switching between an automatic exposure time control mode and a manual exposure time control mode;
first gate means operatively coupled for subjecting an output of said manual exposure time setting means and an output of said detecting means to a logic operation, said first gate means passing the output of said manual exposure setting means in response to said second signal and providing at its output a preselected flash exposure time in response to said first signal;
second gate means operatively coupled for subjecting an output of said automatic-manual change-over means and an output of said detecting means to a logic operation, said second gate means passing the output of said automatic-manual change-over means in response to said second signal, and providing a manual exposure time control mode in response to said first signal;
digital-to-analog converter means for converting a digital output of said first gate means to an analog signal; and
expansion time determination means for providing an exposure time determination in response to an output of one of said arithmetic means and said analog signal produced by said digital-to-analog converter means as determined by an output of said second gate means.

4,324,463
PHOTOGRAPHIC CAMERA

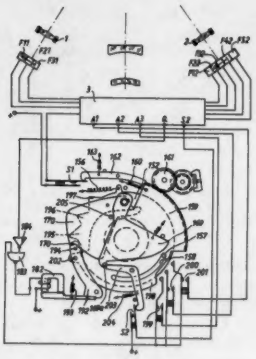
Peter Lermann, Narring; Istvan Cocron, Munich, and Günter Fauth, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 2,932

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801383

Int. Cl.³ G03B 3/10, 7/08, 13/20

U.S. Cl. 354—25 8 Claims



1. An automatic exposure control for an automatic focus photographic camera, comprising:

an adjustable objective successively adjustable to a number of different subject-distance settings;

an objective adjuster movable to a like number of successive positions, each position corresponding to a one of the subject-distance settings of the objective;

a control structure movable together with the objective adjuster through said like number of positions,

a subject-distance detector automatically generating information characteristic of subject-distance to a photographic subject;

a spring-powered drive mechanism urging the objective adjuster and the control structure to move together through said positions successively;

a single electromagnet arresting the objective adjuster in accordance with said information while leaving the control structure unarrested and free to continue to move through further positions successively;

a shutter;

a shutter trigger cooperating with the electromagnet and causing the shutter to open when the control structure reaches one of said further positions past that position at which the objective adjuster is arrested;

a shutter holder cooperating with the electromagnet and causing the shutter to remain open until an exposure is to be determinated;

an electronic exposure timer cooperating with the electromagnet to place the electromagnet in first and second states of energization, such cooperation taking place in a manner that when the electromagnet is placed in the first state of energization the objective adjuster is arrested to place the objective in an appropriate subject-distance setting, and when the electromagnet is placed in the second state of energization, the shutter holder causes the shutter to close and terminates an exposure; and

a start switch starting the exposure timer when at least one of the objective adjuster and control structure reaches a predetermined position.

4,324,464
PHOTOGRAPHIC APPARATUS WITH AUTOMATIC FOCUSING MEANS

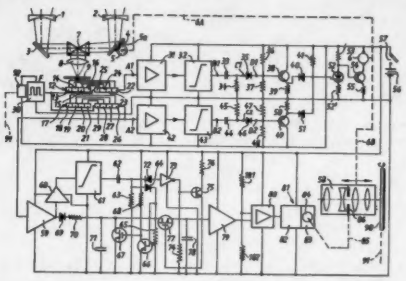
Richard Wick, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 874,495, Feb. 2, 1978, Pat. No. 4,240,726. This application Aug. 14, 1980, Ser. No. 177,984

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705104

Int. Cl.³ G03B 7/081, 13/20

U.S. Cl. 354—25 10 Claims



1. In a photographic apparatus, the combination of monitoring means including means for generating first signals denoting the characteristics of at least a portion of scene light during individual monitoring cycles; adjustable exposure control means; automatic focusing means, said focusing means being adjustable as a function of the intensity of said first signals; first means for transmitting said first signals from said monitoring means to said focusing means; and second means for transmitting from said monitoring means to said exposure control means second signals denoting the peak value or the integral value of said first signals, including means for integrating said first signals during monitoring of said portion of scene light and means for blocking transmission of second signals from said integrating means back to said monitoring means during intervals between successive monitoring cycles.

4,324,465
ARRANGEMENT FOR ADJUSTING COMPONENTS OF PHOTOGRAPHIC APPARATUS OR THE LIKE

Horst Rossbach, Eichenau, and Eduard Wagensonner, Aschheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 4, 1980, Ser. No. 203,955

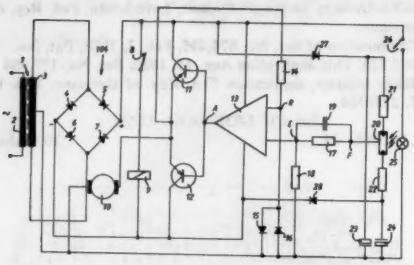
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2946939

Int. Cl.³ G03B 3/10, 7/10

U.S. Cl. 354—25 25 Claims

1. An arrangement for moving a component of photographic apparatus or the like to a predetermined position, comprising electric motor means connected with and operable to move said component; monitoring means for monitoring the position of said component and generating primary signals having primary magnitudes indicative of the instantaneous position of said component; and circuit means establishing a path for transmission of said primary signals to said motor means to thereby regulate said motor means in response to said primary signals, said circuit means including modifying means for modifying said primary signals so as to produce modified signals

having modified magnitudes such that said monitoring means generates a primary signal indicative of said predetermined



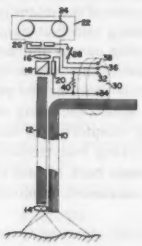
position at a preselected time interval before completion of movement of said component to said predetermined position.

4,324,466

LIGHT SOURCE APPARATUS FOR ENDOSCOPE

Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,504
Claims priority, application Japan, Sep. 3, 1979, 54/112635
Int. Cl.[3] G03B *7/16, 29/00*
U.S. Cl. 354—33 8 Claims



1. A light source apparatus for a photographing endoscope arrangement for use with a camera, comprising:

light-emitting means;

a synchronizing terminal for receiving a synchronizing signal synchronized to a shutter release operation from a camera;

signal generating means coupled to said synchronizing terminal and being responsive to said synchronizing signal for producing a first signal for a first predetermined period of time and for subsequently producing a second signal for a second predetermined period of time;

gate means coupled to said synchronizing terminal and to said signal generating means and rendered conductive to pass said synchronizing signal to an output of the gate means responsive to said first signal and in the absence of said second signal, said gate means being rendered non-conductive so as not to pass said synchronizing signal during the presence of said second signal; and

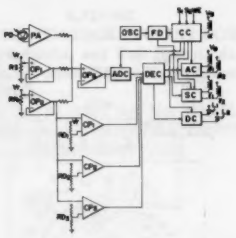
energizing means coupled to the output of said gate means and to said light-emitting means for causing said light-emitting means to produce a light dose required for photographing by enabling said light-emitting means for a third predetermined period of time responsive to the output of said gate means.

4,324,467

PROGRAMED EXPOSURE CONTROL DEVICE

Kazuo Shiozawa, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,664
Claims priority, application Japan, Dec. 18, 1979, 54-163540; Dec. 18, 1979, 54-163541; Dec. 18, 1979, 54-163542
Int. Cl.[3] G03B *7/097*
U.S. Cl. 354—38 3 Claims



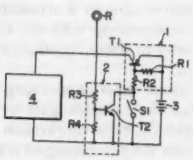
1. A programmed exposure control device for changeable lens type camera of the type in which the object brightness information is corrected in accordance with other exposure informations including the open F value and the corrected brightness information is ranked to permit the determination of the aperture value in accordance with the rank in a stepped manner and the determination of the shutter speed in accordance with the rank and the brightness information, characterized in that said device is further including at least one comparison circuit to compare whether the open F value is greater than the smallest aperture value corresponding to the rank or not and is so constructed as to provide, when the open F value of the lens to be used is greater than the smallest aperture value corresponding to the rank, a shutter speed signal representing a shutter time length is determined which is longer than the shutter time length corresponding to the rank which provides the open-side aperture value closest to the open F value of the lens and to the brightness information, by a time length corresponding to a predetermined light value.

4,324,468

ELECTRIC SOURCE CIRCUIT FOR CAMERA

Eiichi Tano, Fukuoka, and Koji Suzuki, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1980, Ser. No. 197,356
Claims priority, application Japan, Nov. 2, 1979, 54/152714[U]
Int. Cl.[3] G03B *15/05*
U.S. Cl. 354—149 4 Claims



1. In an electronic source circuit for a camera having in the viewfinder thereof a display element which is activated upon the completion of charging of an electronic flash unit on the camera when a photometric switch is manually closed to connect a power source to the exposure control and display circuit of the camera, the improvement comprising:

first switching circuit means coupled between the power source and the exposure control and display circuit, said switching circuit means being rendered conductive upon closing of the photometric switch to connect the power source to the exposure control and display circuit; and

second switching circuit means, connected in parallel with the photometric switch and rendered conducting in response to the charge voltage upon completion of the charging of the electronic flash unit, for connecting the power source to the exposure control and display circuit even when the photometric switch is open.

4,324,469

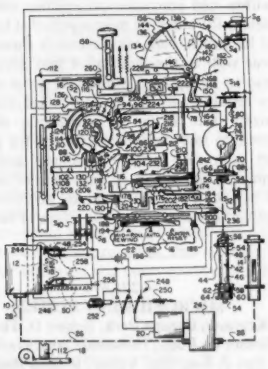
CAMERA ADAPTED TO FACILIATE REMOVAL AND REUSE OF PARTIALLY EXPOSED FILM CASSETTES

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 8, 1980, Ser. No. 166,939

Int. Cl.³ G03B *1/00, 1/60*

U.S. Cl. 354—214 **4 Claims**



1. In a camera adapted to receive rewindable, cassette loaded film having a leader portion and an image receiving portion, said camera including film advancing means for withdrawing film from the cassette, means for sensing the position of the film relative to the cassette and film rewinding means for rewinding film into the cassette, the improvement comprising: adjusting means for selectively adjusting said rewinding means to:

(a) a first condition in which said rewinding means is controlled by said sensing means to rewind the image receiving portion of said film into said cassette and then to automatically terminate its rewinding function to leave at least part of the leader portion of the film extending out of the cassette, and

(b) a second condition in which said rewinding means is controlled by said sensing means to rewind all of the film, including the leader portion, entirely into the cassette, and then to automatically terminate its rewinding function.

4,324,470

LIGHT INTERCEPTING DEVICE OF A CAMERA

Hiroshi Terunuma, Ichikawa, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

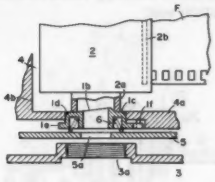
Filed Jan. 19, 1981, Ser. No. 226,511

Claims priority, application Japan, Jan. 11, 1980, 55-11046[U]

Int. Cl.³ G03B *19/04, 1/04, 17/02*

U.S. Cl. 354—214 **4 Claims**

1. In a camera which has a through-hole formed in a portion of a wall forming a chamber for containing therein a magazine of roll film wound around a spool shaft which faces the end surface of said spool shaft and to which is mountable an electric film rewind device having a drive shaft inserted into said chamber through said through-hole and coupled to said spool shaft and wherein a light-intercepting ring having a contact surface bearing against the end surface of said spool shaft and biased axially of said spool shaft toward the interior of said chamber is slidably fitted in said through-hole, the improvement residing in that said light-intercepting ring (**1**, **10**, **100**) has on said contact surface an annular ridge (**1***b*, **10***b*, **100***b*) projected axially of said spool shaft, said ridge being provided at a location which is adjacent to and along said end surface during the contact thereof with said end surface.



4,324,471

ELECTROMAGNETIC DRIVE DEVICE FOR CAMERA

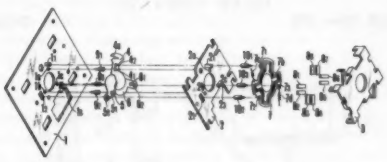
Yukio Ogawa, Kawasaki, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,280

Claims priority, application Japan, Apr. 28, 1979, 54-57163[U]

Int. Cl.³ G03B *9/22*

U.S. Cl. 354—234 **3 Claims**



1. An electromagnetic drive device for a camera comprising:

(a) shutter blades made of synthetic resin, said shutter blades having axle bores formed therein:

(b) a shutter drive rotor having coil patterns arranged on opposite surfaces thereof, said rotor having axle bores formed therein;

(c) drive axles for drivingly connecting said rotor with said shutter blades, said drive axles being electrically conductive and fixed at respective ends thereof in said respective rotor axle bores to enable the coil pattern on one surface of said rotor to couple electrically with the coil pattern on the opposite surface thereof, the opposite ends of said drive axles being received in said respective shutter blade axle bores; and

(d) permanent magnets arranged to apply a magnetic field to said coil patterns, said magnetic field and said coil patterns producing an electromagnetic force that moves said rotor, thereby controlling the operation of the shutter blades.

4,324,472

SWITCH FOR CAMERA

Katumi Terada, and Michiharu Saito, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed May 18, 1979, Ser. No. 40,169

Claims priority, application Japan, Jun. 14, 1978, 53-81240

Int. Cl.³ G03B *17/38;* **H01H** *13/70*

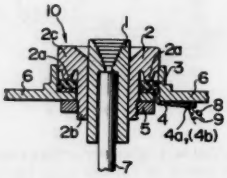
U.S. Cl. 354—266 **8 Claims**

1. A switch for a camera adapted to be disposed on the

surface of said camera including a shutter release button, said switch comprising:

a button seat which surrounds said shutter release button and which is movable independently of and along said shutter release button;

a switching element which is made of a resilient and conductive material, said switching element being disposed beneath said button seat;



a pair of conductive contacts;

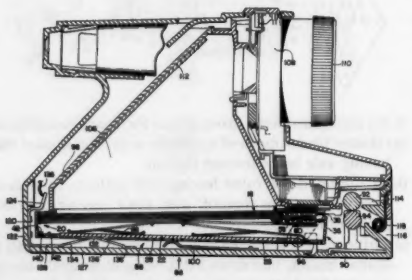
said switching element being adapted to bridge across said pair of conductive contacts in response to an external pressure applied to said switching element through said button seat when it is depressed, whereby said switch is rendered conductive.

4,324,473

SX-70 FILM PACK WITH BATTERY HOLD DOWN STRUCTURE

Edward H. Coughlan, Norwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1980, Ser. No. 193,618
Int. Cl.³ G03B *17/26*
U.S. Cl. 354—276 **7 Claims**



1. A photographic film assemblage for use with battery energized photographic apparatus of the type including a chamber for slidably receiving and supporting said assemblage at a fully inserted operative position and a pair of resiliently displaceable battery contact members in the chamber, each contact member including a convexly-bowed, electrically-conductive leaf spring having an upwardly facing battery contact at the apex of the leaf spring, said assemblage comprising:

a film container having a plurality of walls including a forward wall having an exposure aperture therein, a rear wall oppositely spaced from said forward wall and engageable with said battery contact members as said film container is inserted into the chamber for compressing said leaf springs so that aligned facing sections of said rear wall may slide over said battery contacts, and a leading end wall having a film withdrawal slot therein adjacent said forward wall;

means for defining a pair of generally diamond-shaped battery terminal access openings in said rear wall configured to be registered with the battery contacts when said film container is at said operative position thereby allowing said contacts to extend into said container under the bias of said leaf spring to a depth of penetration limited by engagement of portions of said leaf springs on opposite sides of said corresponding contacts with portions of said rear wall defining edges of said access slots;

a plurality of film units arranged in stacked relation within said container behind said forward wall so that when the forwardmost film unit is urged against the interior surface of said forward wall it is in position for exposure through said exposure aperture and subsequent advancement through said withdrawal slot;

a substantially flat electrical battery located within said container and having a pair of battery terminals on its rear surface which is configured to overlie the interior surface of said rear container wall with said terminals in facing registration with said access openings;

a spring platen located between the rear of said stack of film units and the forward surface of said battery for urging said stack towards said forward wall so that said forwardmost film unit is pressed against said forward wall interior surface; and

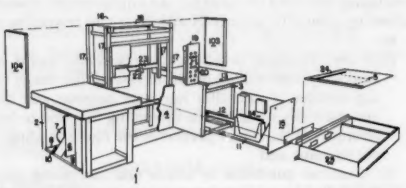
means within said container engageable with a portion of said battery for blocking movement of at least that section of said battery having said terminals thereon away from said rear wall in the vicinity of said access openings in response to an upwardly directed force applied to said battery terminals by the spring biased contacts thereby minimizing the depth of penetration of said battery contacts into said container required for good electrical contact with said battery terminals and consequently widening the tolerances of the shape of said leaf springs which can achieve such minimum penetration before the leaf spring portions engage the edges of said access openings.

4,324,474

MICROFILMING SYSTEM

Edward J. Kraemer, Canoga Park; Robert D. Therien, Newbury Park; Michael W. Rudy, Thousand Oaks; Frederick E. Walsh, Reseda; Han J. Lee, Simi Valley; Ronald Bell, North Hollywood, and Thomas D. Horning, Sepulveda, all of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Filed May 21, 1980, Ser. No. 152,071
Int. Cl.³ G03B *27/58, 27/64, 27/80*
U.S. Cl. 355—65 **15 Claims**



1. A microfilming system, comprising;

(a) a support (**25**),

(b) plural tables (**24,70,73,91**) selectively horizontally fitable upon said support to horizontally receive a document (**5**),

(c) a stationary camera (**26**), having film, a shutter, and actuating means,

(d) a non-image-reversing plural-reflective orthogonal optical system (**29,27,27'**) for forming an image of said document upon said film,

(e) adjustable mask means (**42,44**) intermediately disposed in said optical system relatively adjacent to said document to fix the size of the image upon said film,

(f) means (**46-49**) to illuminate said document,

(g) an exposure control (**22**) disposed to receive illumination reflected from said document, and

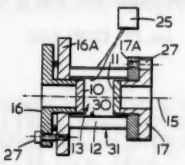
(h) a microprocessor (**50,51**) for receiving information re-

garding the presence of (57) and the size of (57') a said document upon said table, and from the output of said exposure control, and for exercising control over said actuating means of said camera, said shutter, and the size of the opening of said mask, in accordance with the information received, on a priority interrupt basis in which exposure of said film has the highest priority.

4,324,475
LASER COMPONENT

Anthony F. Purdie, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Apr. 29, 1980, Ser. No. 145,496
Claims priority, application United Kingdom, Jun. 26, 1979, 22261/79
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—352 **9 Claims**

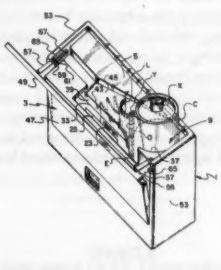


1. An etalon for use in a laser comprising a pair of plates respectively mounted at the ends of a tube with the distal faces of the plates parallel, the chamber formed within the tube between the plates being substantially completely filled with a fluid whose refractive index matches that of the plates, and means for causing extension and contraction of the axial spacing of the plates.

4,324,476
CAMERA DOOR APPARATUS

Neil G. Seely, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1981, Ser. No. 260,876
Int. Cl.³ G03B *17/02, 1/00*
U.S. Cl. 354—288 **8 Claims**



1. In a photographic camera of the type wherein a loading door is opened to allow insertion of a film container into said camera, and a back door is opened to move a film pressure member on said back door to provide space for locating film from the container in said camera, the improvement comprising:

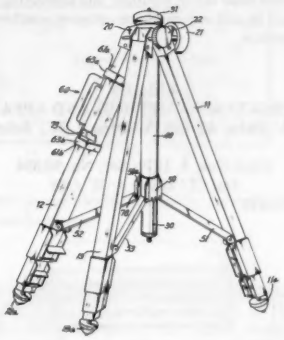
means supporting said loading door and said back door for opening and closing movement on separate axis; and

moving means for opening said back door in response to opening movement of said loading door and for closing said back door in response to closing movement of said loading door.

4,324,477
PHOTOGRAPHIC TRIPOD APPARATUS

Kiyoshi Miyazaki, Tokyo, Japan, assignor to Kabushiki Kaisha L.P.L, Japan

Filed Nov. 18, 1980, Ser. No. 207,965
Int. Cl.³ G03B *17/00*; F16M *11/38*
U.S. Cl. 354—293 **16 Claims**

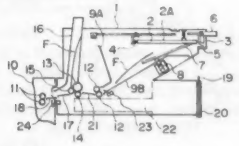


1. Photographic tripod apparatus comprising: a base plate; a set of legs, each of which is pivotally mounted on one of its ends to said base plate; an elongate elevator support extending through said base plate; a sleeve-type bushing situated over said elongate elevator support and extending downwardly from an under surface of said base plate to at least partially enclose said elevator support; a slidable member situated over the outer peripheral surface of said bushing so as to be vertically slidable thereover; a linkage assembly including a set of rods, each of which is pivotally mounted at one of its ends to a respective one of said legs and at its other end to said slidable member, whereby said legs are operatively coupled to said slidable member so that movement of said slidable member to a particular position on said bushing causes said legs to pivot to a collapsed position; a handle member provided on one of said legs adapted to be held by a single hand whereby the apparatus can be carried thereby; and latching means extending between said handle and slidable members for holding said legs in the collapsed position, said latching means being adapted to be operated by the same hand holding said handle member.

4,324,478
PHOTOSENSITIVE SHEET HANDLING METHOD AND DEVICE

Osamu Fukushima; Masahide Akisada, and Takashi Koizumi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 19, 1980, Ser. No. 151,050
Claims priority, application Japan, May 24, 1979, 54-64297; Jun. 8, 1979, 54-72045
Int. Cl.³ G03D *3/08*; G01N *23/04*
U.S. Cl. 354—312 **10 Claims**



1. A method for processing photosensitive sheets to an automatic developing machine comprising the steps of: opening a

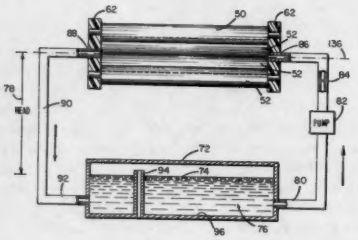
cassette holding a photosensitive sheet; allowing said photosensitive sheet to drop by force of gravity in response to said step of opening said cassette; delivering said photosensitive sheet thus dropped to a retaining position shielded from light at a speed higher than a conveyance speed in said automatic developing machine which subsequently processes said photosensitive sheet; shifting a rear edge of said photosensitive sheet to a self-weight slide down position; and delivering said photosensitive sheet to said automatic developing machine from said retaining position.

4,324,479

FILM PROCESSING METHOD AND APPARATUS

Emanuel M. Sachs, 42 Old Middlesex Rd., Belmont, Mass. 02172

Filed Nov. 1, 1979, Ser. No. 90,394
Int. Cl.³ G03D *3/08, 3/06*
U.S. Cl. 354—319 **14 Claims**



1. In an automatic film processor of the type in which the processing tanks are formed by a plurality of contacting rollers, a method of leak prevention comprising:

providing a processing tank with a closed loop liquid delivery system; and,

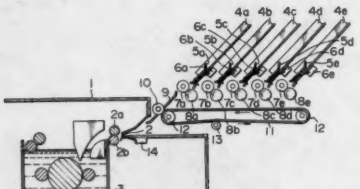
controlling the pressure within the loop such that the internal tank pressure is less than the atmospheric pressure at the exterior of the tank.

4,324,480

AUTOMATIC FILM FEEDER FOR AN AUTOMATIC DEVELOPER

Norimasa Nomura, Mori, and Atsushi Yoshida, Kyoto, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 17, 1981, Ser. No. 235,423
Claims priority, application Japan, Feb. 27, 1980, 55/23676
Int. Cl.³ G03D *3/12*
U.S. Cl. 354—320 **11 Claims**



1. An automatic film feeder for an automatic developer wherein a film exposed is processed through a developing tank, comprising:

(a) an endless belt for transferring a film to a developer;

(b) a plurality of trays which are arranged above the belt and each of which contains one film;

(c) film ejectors of the same number as the trays, each ejecting the film from the corresponding tray onto the belt; and

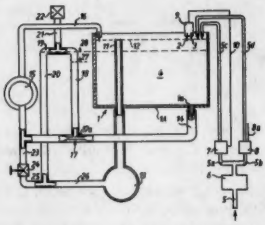
(d) a control means which controls the ejectors so that the films may be ejected from the trays in the desired order and may be fed to the developer one by one without overlapping one on another.

4,324,481

DEVELOPING MACHINE FOR RADIATION-SENSITIVE MATERIAL

Walter Becherer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 229,770
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005471
Int. Cl.³ G03D *3/06*
U.S. Cl. 354—324 **15 Claims**



1. In a developing machine for radiation-sensitive material, the combination comprising a vessel having an upper portion and a lowermost portion and arranged to normally confine a body of liquid having an upper surface located at or close to a predetermined level; means for circulating the liquid along a first path extending from the lowermost portion, outside of and to the upper portion of said vessel, said circulating means including pipe means and a first pump installed in said pipe means; liquid removing means; and means for evacuating the contents of said vessel in response to stoppage of said first pump along a second path extending between an intermediate portion of said first path and said removing means, said evacuating means including a jet pump installed in said intermediate portion of said first path and having a suction side, and a siphon having an intake end connected with said suction side and a discharge end connected with said removing means, said siphon having an uppermost section disposed at a level above said jet pump and below said predetermined level.

4,324,482

PRESSURE ROLL CLEANING DEVICE

Thomas F. Szlucha, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1980, Ser. No. 210,966
Int. Cl.³ G03G *15/00*; F27B *9/28*
U.S. Cl. 355—3 FU **4 Claims**

1. Roll fuser apparatus comprising:

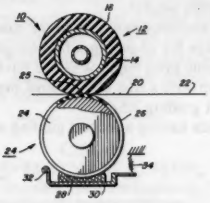
a heated fuser roll;

a backup roll cooperating with said fuser roll to form a nip through which copy substrates carrying toner images pass with the toner images contacting said heated fuser roll;

a cleaning pad;

means for supporting said cleaning pad in rubbing contact with

said backup roll for removing toner therefrom, said pad being constructed such that about 75% of its total volume is made up of intercommunicated voids whereby the removed toner can freely pass into and through the pad.

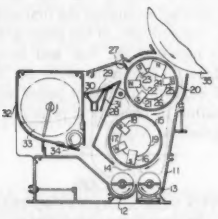


4,324,483

MAGNETIC BRUSH DEVELOPMENT APPARATUS

Kazuaki Tagawa, Tokyo; Minoru Suzuki, Yokohama, and Makoto Hashimoto, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,646
Claims priority, application Japan, Aug. 21, 1979, 54-106169; Sep. 4, 1979, 54-113262; Sep. 4, 1979, 54-113263
Int. Cl.[3] G03G *15/00, 15/09*
U.S. Cl. 355—3 DD 5 Claims



1. In a magnetic brush development apparatus comprising a rotatable, non-magnetic sleeve for development having stationary, inner magnets therein, and at least one rotatable, non-magnetic sleeve having similar stationary, inner magnets therein, for supplying developer to said first rotatable, non-magnetic development sleeve, the improvement wherein said magnets in the sleeves located in a developer transition region where the developer is transferred from the developer supplier sleeve to the development sleeve are of the same polarity.

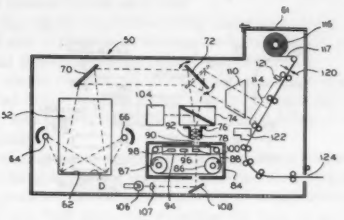
4,324,484

MICROFILM FILING SYSTEM

Delmar R. Johnson, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 1, 1980, Ser. No. 192,787
Int. Cl.[3] G03B *13/26, 15/00*
U.S. Cl. 355—5 28 Claims

1. A microfilm document recording and retrieval system comprising means for microcopying on a web images of individual documents; means for simultaneously recording on said web an operator-assigned, document-identifying, machine-readable code adjacent each microcopied document; means for immediately processing the microcopied image so that it is available for retrieval; means for identifying to said system a preselected one of said machine readable codes; means for searching over said web for said preselected code; and means responsive to finding said preselected code for selectively projecting the image identified thereby onto either a screen or a printing mechanism.

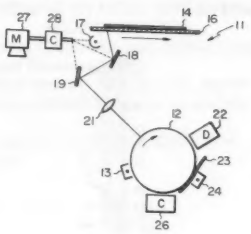


4,324,485

ELECTROSTATIC COPYING APPARATUS

Kouichi Asakura, and Toyoo Okamoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,902
Claims priority, application Japan, Nov. 20, 1978, 53-142253
Int. Cl.[3] G03G *15/28;* G03B *27/72*
U.S. Cl. 355—8 7 Claims



1. An electrostatic copying apparatus including a document support platen, document scan means and scan drive means for producing reciprocating relative movement between the platen and the scan means including a scan stroke and a return stroke, characterized by comprising:

control means for energizing the scan drive means to perform the scan stroke, then de-energizing the scan drive means for a predetermined length of time and then energizing the scan drive means to perform the return stroke;

the scan means comprising a document illumination light source, the control means energizing the light source when energizing the scan drive means to perform the scan stroke and de-energizing the light source after substantially the predetermined length of time has elapsed after termination of the scan stroke.

4,324,486

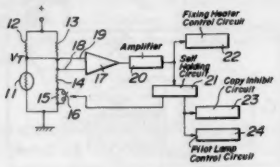
RECORDING DEVICE INCLUDING A HEATING MEANS

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 4, 1979, Ser. No. 44,968
Claims priority, application Japan, Jun. 8, 1978, 53/68253
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 FU 10 Claims

1. In a recording device including a heating means being operated and controlled to a predetermined operating temperature, means for inhibiting starting of recording by the recording device until the heating means reaches a predetermined operating temperature after a power supply source of the

recording device has been switched on, and an operating means for performing the start of recording, said operating means being effective after the heating means has reached the predetermined operating temperature, wherein:



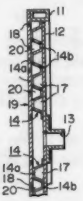
the improvement comprises: means for releasing said inhibiting means so as to allow the start of recording upon actuation of said operating means within a certain time period before the heating means has reached the predetermined operating temperature.

4,324,487

FILM SUCTION PLATE FOR A PROCESS CAMERA

Takamichi Nishihama, Hikone, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Jan. 29, 1981, Ser. No. 229,464
Claims priority, application Japan, Feb. 21, 1980, 55-19714
Int. Cl.³ G03B *17/26, 27/60*
U.S. Cl. 355—73 **5 Claims**



1. A film suction plate for a process camera, comprising:
a base frame;
a base plate having a suction pipe in its center, which is mounted to the rear of the base frame;
a perforated plate having a plurality of small holes, which is mounted to the front of the base frame so that the base frame, the base plate and the perforated plate may compose a box-shape; and
corrugated plates which are mounted between the base plate and the perforated plate so that tops and bottoms of the corrugated plates may be arranged concentrically and so that ventilating paths whose widths are widened gradually from the edges of the base plate toward the suction pipe, may be formed in spaces between the corrugated plates.

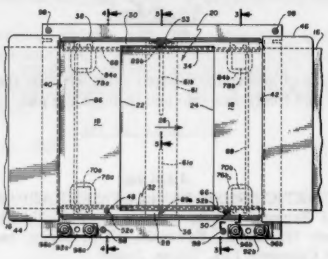
4,324,488

FLOATING EDGE-FOLLOWER BORDERED PAPER MASK

Richard D. Anderson, Maple Grove; Ronald B. Harvey; Randall C. Knudsen, both of Minneapolis, and John A. Wedel, Crystal, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed May 19, 1980, Ser. No. 151,131
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—74 **28 Claims**

1. For use in a photographic printer in which a photographic print paper web is sequentially advanced across a paper deck and photographic images are sequentially exposed thereon, apparatus for masking the photographic print web during exposure of the photographic images paper to create unexposed borders along first and second longitudinal edges of the print paper web, the apparatus comprising:
a base adapted to be mounted on the paper deck of the photographic printer;
a first guide movably mounted to the base and having a first guiding edge for engaging a first longitudinal edge of the photographic print paper web and having an overhanging masking lip with a first longitudinal masking edge parallel to the first guiding edge;
a second guide having a second guiding edge for engaging a



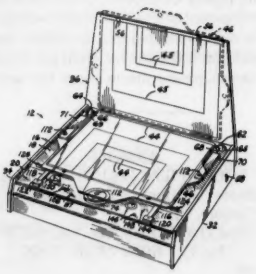
second longitudinal edge of the photographic print paper web and having an overhanging masking lip with a second longitudinal masking edge parallel to the second guiding edge; and
means for yieldably urging the first and second guides toward one another to engage the first and second longitudinal edges, respectively, of the photographic print paper web and to maintain the first and second longitudinal masking edges in alignment with the first and second longitudinal edges of the print paper web, respectively, despite variation in transverse positions of the first and second longitudinal edges.

4,324,489

APPARATUS FOR MODIFYING IMAGES ON PHOTOGRAPHIC FILM

Thomas L. Byers, P.O. Box 26624, Oklahoma City, Okla. 73126

Continuation-in-part of Ser. No. 5,617, Jan. 22, 1979, Pat. No. 4,268,166. This application Sep. 2, 1980, Ser. No. 183,119
Int. Cl.³ G03B *27/10*
U.S. Cl. 355—84 **7 Claims**



1. In a graphics modifier having a planar base defining forward and rearward ends and supported by opposing side panels, a stationary face plate overlying the base and a planar transparent film carriage superposed on the face plate, the improvement comprising:
motion guide means mounted on said base and connected

with a marginal edge portion of said film carriage for moving said film carriage in an orbital path of predetermined magnitude;

motor means drivably connected with said motion guide means; and,

arm, shaft and flexible rod means connecting opposing marginal edge portions of said film carriage remote from said motion guide means with said base for maintaining marginal edges of said film carriage parallel with the respective marginal edges of said base during motion guide means induced orbital movement.

4,324,490

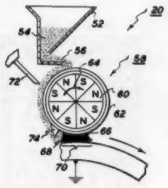
DEVELOPMENT SYSTEM

Paul W. Burnham, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1980, Ser. No. 144,510

Int. Cl.³ G03G *15/00, 15/09*

U.S. Cl. 355—3 DD **30 Claims**



1. An apparatus for developing a latent image with developer material, including:

means for transporting the developer material;

a plurality of fibers extending outwardly from said transporting means with the free end regions of at least a portion of said fibers being closely adjacent to the latent image; and

means, secured to said transporting means, for guiding the developer material being transported to the free end regions of said fibers to develop the latent image therewith.

4,324,491

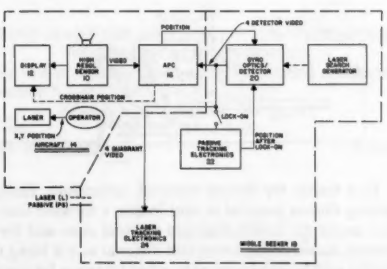
DUAL MODE GUIDANCE SYSTEM

Werner G. Hueber, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1973, Ser. No. 334,173

Int. Cl.³ G01B *11/26;* F41G *7/00;* G01J *1/20*

U.S. Cl. 356—152 **5 Claims**



1. A dual mode guidance system having a first, passive mode and a second, active mode in which a missile seeker is aligned with a sensor in response to the output of the sensor in the first mode, and the seeker acquires a laser illuminated object and the outputs of the seeker and the sensor are compared to determine whether or not the object illuminated is the object of interest in the second mode, wherein the modes are mutually exclusive and selectable by the operator, comprising:

sensing means for electronically scanning the field of view of said system and providing a video signal output thereof;

a source of laser light for selectively illuminating an object of interest within said field;

seeking means for electronically scanning at least a portion of said field of view independently of said sensing means and providing a video signal output thereof;

first means coupled to said seeking means for aligning the scan of said seeking means with the illumination reflected by said laser illuminated object in the second of said dual modes;

correlating means coupled to the video signal outputs of said seeking means and said sensing means for comparing said signals and providing an error signal to said seeking means in said first mode for adjusting the scan of said seeking means such that its scan is aligned with a pre-selected portion of the scan of said sensing means, and providing an output in said second mode indicative of the scene scanned by said seeking means; and

displaying means coupled to said sensing means and said correlating means for visually displaying the field of view scanned by said sensing means in said first mode, and visually displaying a graphic representation of the portion scanned by said seeking means in covering relationship to said field of view display in said second mode.

4,324,492

METHOD OF AND ARRANGEMENT FOR PERFORMING OPTICAL INTERFERENCE MEASUREMENTS

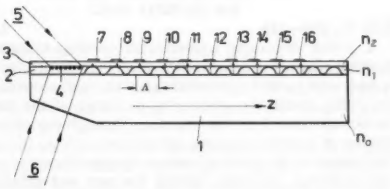
Jürgen Drenckhan, Greifswald, and Roland Trinks, Querfurt, both of German Democratic Rep.

Filed May 21, 1979, Ser. No. 40,935

Claims priority, application German Democratic Rep., Jun. 1, 1978, 205706

Int. Cl.³ G01B *9/02;* G02B *5/14*

U.S. Cl. 356—345 **2 Claims**



1. Method of optical interference meansurement by means of an integrated optical arrangement, comprising the steps of coupling two modes to a waveguide, effecting interference between said two modes within said waveguide, and measuring the relative phase positions of both modes varied through a measuring operation.

4,324,493

MIXER-COOLER DEVICE FOR THE EXTRUSION OF THERMOPLASTIC FOAMS

Roberto Colombo, Turin, Italy, assignor to Lavorazione Materie Plastiche L.M.P-S.p.A., Turin, Italy

Filed Jul. 8, 1980, Ser. No. 166,874

Claims priority, application Italy, Aug. 6, 1979, 68617 A/79

Int. Cl.³ B29B *1/06, 3/00*

U.S. Cl. 366—79 **9 Claims**

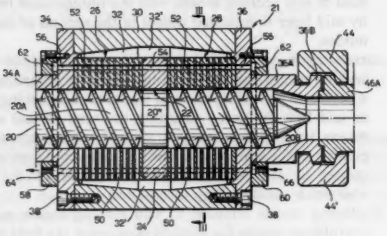
1. A mixer device for the extrusion of thermoplastic material comprising:

a barrier disc having a central axially extending circular aperture,

a pair of cylindrical blocks having axially extending circular apertures disposed in axial alignment against opposite faces of said disc, each of said blocks having a plurality of radial holes extending therethrough,

a tubular casing surrounding said disc and said blocks in concentric spaced relation to define a collector channel,

a pair of head plates having central axially extending circular apertures connected to opposite ends of said casing and clamping said blocks against said disc,



an advancement screw rotatably mounted in said circular apertures and having an intermediate barrier section sealingly rotatable in said barrier disc whereby material conveyed by said advancement screw from one end of said device to the other is forced outwardly through the radial holes in one block, axially over the outer periphery of said disc and inwardly through the radial holes in the other block, and

passage means extending through said headplates, blocks and disc for the circulation of a coolant fluid.

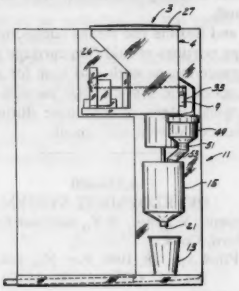
4,324,494

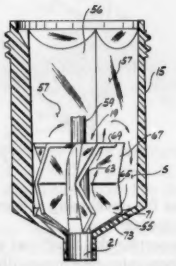
DRINK DISPENSING

Harry H. Pryor, Crestwood, and James J. Schinker, Hazelwood, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Nov. 19, 1979, Ser. No. 95,209
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—156 **16 Claims**

1. Drink dispensing apparatus comprising a container for holding a supply of a particulate drink ingredient adapted to be mixed with water to constitute a drink, said container having an outlet, means for dispensing a charge of the particulate drink ingredient from the container through the outlet for the mixing of a drink, a mixing and delivery system for receiving the charge of the drink ingredient disposed from the container and a charge of water, mixing the two and delivering the resultant drink into a cup, said system comprising a blender, and means for supplying said charge of water for mixing with said charge of the drink ingredient in the blender, said blender having means for mixing said charges while holding them in the blender and having an outlet for flow of the resultant mixture out of the blender and into a cup after mixing has been completed, the outlet of the blender being a constantly open outlet, said mixing means comprising an impeller rotatable in the blender for mixing the drink ingredient and the water adapted when in operation to impel the water away from the blender outlet thereby to hold the drink ingredient and the water in the blender for the mixing thereof without closing the blender outlet, the blender defining a mixing chamber, the impeller having blades for impelling the water away from the outlet and around the interior periphery of the chamber, the mixing chamber being of non-circular shape in transverse section with certain portions of its interior periphery disposed closely adjacent to the surface of revolution defined by the rotating impeller, and other portions of its interior periphery spaced radially outwardly of the surface of revolution so as to provide spaces between the interior periphery of the mixing chamber and the surface of revolution enabling water to flow back toward the blender outlet after it has been impelled away from the blender outlet, the impeller and said spaces thereby





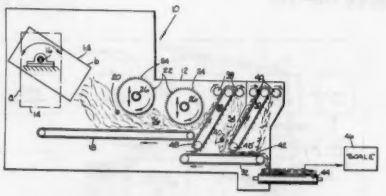
enabling the water to be circulated within the mixing chamber during the mixing of the drink.

4,324,495

FIBER FEEDER PULLEY CLEANING SYSTEM

Emilio M. Martinez, Windsor, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Jul. 24, 1980, Ser. No. 171,779
Int. Cl.³ B01F *7/02*
U.S. Cl. 366—271 **3 Claims**



1. In a feeder for fibrous material, comprising means for supplying fibrous material to said feeder, a forward feed conveyor, means for distributing said material onto said forward conveyor, means for agitating said material as it is being transported by said forward conveyor, a first lift apron for receiving fibrous material from said forward conveyor, said first lift apron being provided with a plurality of pulleys, a conveyor belt being trained for movement around said pulleys, said belt comprising a plurality of slats, a plurality of tines fixedly supported upon each of said slats and means for conveying said fibrous material from said feeder, the improvement comprising:

at least one of said pulleys comprising an open-ended cylindrical drum,

a plurality of waste fibrous material intake openings extending through the exterior surface of said drum, said openings being staggered along the circumference of said drum and being sized to ensure noninterference with the motion of said slats and proper flow of waste material into said drum; and

means for conveying said waste material from said drum.

4,324,496

TYPE DISC PRINTER

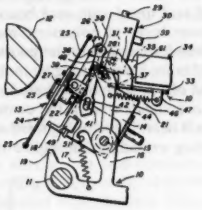
Manfred Link, Nuremberg, Fed. Rep. of Germany, assignor to Triumph-Adler A.G., Nuremberg, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,648

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014286

Int. Cl.³ B41J *1/46*

U.S. Cl. 400—144.2 **7 Claims**



1. Printing mechanism including a support frame,

a type disc drive assembly pivotally mounted on said support frame for movement from a printing position to a type disc change position,

a hammer magnet assembly pivotally mounted on said support frame for movement from a type disc impacting position to an inoperative position to a type disc change position, and

means to enable said hammer magnet assembly to be moved from said impacting position to said inoperative position without movement of said type disc drive assembly, said means further serving to pivot said type disc drive assembly to said type disc change position in response to movement of said hammer magnet assembly from said inoperative position to said type disc change position, said means including a lost motion connection between said hammer magnet assembly and said type disc drive assembly.

4,324,497

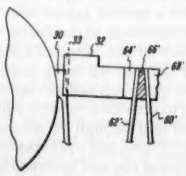
PRINT HAMMER ASSEMBLY WITH AMPLIFIED MULTI-LOCATION IMPACTS

Andrew Gabor, Alamo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1979, Ser. No. 91,657

Int. Cl.³ B41J *9/02*

U.S. Cl. 400—144.2 **6 Claims**



1. A print hammer assembly for use with a platen upon which a record receiving member may be supported, a movable print element bearing a plurality of print characters, and means for moving said print element from character to character and for stopping said print element for impaction, said hammer assembly comprising:

a hammer element;

hammer actuator means for moving said hammer element under force toward said platen and impacting said print element when said actuator means is energized;;

a support structure movable by said hammer actuator means acting adjacent a first location thereon and connected to said hammer element at a second location thereon; and

spring means coupled to said hammer element for causing said hammer element to impact said print element more than one time for each energization of said hammer actuator means and for altering the location of maximum impact force of said hammer element following initial impact of said hammer element, said spring means comprising a plurality of adjacent, non-parallel spring members each coupling said hammer element to said support structure.

4,324,498

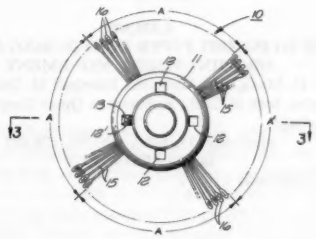
MULTIPLE INDEX PRINTWHEEL

Maxwell Steinhardt, Orinda, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed Feb. 26, 1980, Ser. No. 124,766

Int. Cl.³ B41J *00/00*

U.S. Cl. 400—144.2 **2 Claims**



1. A printwheel for a printer comprising:

a hub;

multiple sets of spokes attached to said hub and extending radially therefrom, a character type or font being formed at the ends of said spokes; and

multiple index means in said hub for receiving an index pin associated with said printer, a separate index means being associated with each of said sets of spokes, each of said separate index means being positioned substantially at the same relative location in said hub with respect to its associated set of spokes, each said index means being provided with a layer of material positioned such that said index pin will puncture the layer provided on one of said index means when said printwheel is installed on said printer.

4,324,499

CONTROL UNIT FOR A SERIAL PRINTER

Felice Giacone, Via Rosario di Santa Fe, 14, 10100 Torino, Italy

Filed Feb. 26, 1980, Ser. No. 124,952

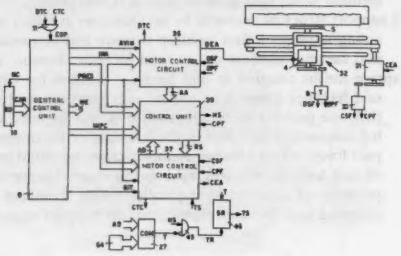
Claims priority, application Italy, Feb. 26, 1979, 67417 A/79

Int. Cl.³ B41J *1/26, 19/30*

U.S. Cl. 400—144.2 **15 Claims**

1. A serial printer comprising a carriage movable by a motor along a printing line from a preceding print position to a new print position; a print hammer and a rotatable type member mounted on the carriage; selecting means for intermittently rotating said type member a variable angle from one character position to another character position according to a predetermined law of motion for positioning a selected character in front of the print hammer, in the path of the impact of said

selected character; length of selection time forecast means for generating length of selection time data dependent on a forecast length of selection time required by said selecting means for the rotation of the type member through said variable angle; control means comprising a servo control feedable with predetermined speed data dependent on the selection length of



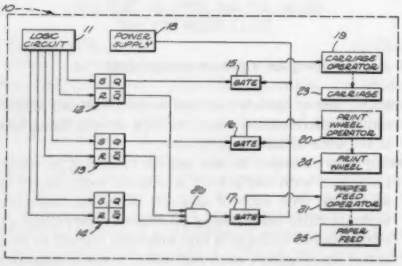
selection time data causing said motor to maintain said carriage in movement during the impact of said hammer; and updating means for feeding said servo control with updated speed data dependent on an updated forecast of the length of selection time effected during rotation of said type member through said variable angle.

4,324,500

MEANS TO INHIBIT PAPER FEED DURING CARRIAGE OR PRINT WHEEL MOVEMENT

Suhdok D. Moon, Los Altos, and Marshall H. Trackman, San Leandro, both of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed Aug. 15, 1980, Ser. No. 178,682
Int. Cl.³ B41J *29/54*
U.S. Cl. 400—664 **3 Claims**



1. A printer comprising: a carriage; a carriage operator; a printwheel mounted on said carriage; a printwheel operator; a paper feed; a paper feed operator; and first means including a power supply actuable to deliver respective electric currents to said carriage operator, said printwheel operator, and said paper feed operator, said first means including second means to inhibit movement of said paper feed when either said carriage or said printwheel is being moved.

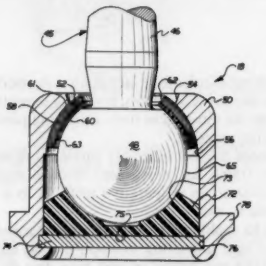
4,324,501

JOINT ASSEMBLY

Edward J. Herbenar, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 5, 1979, Ser. No. 82,281
Int. Cl.³ F16C *11/00;* F16D *1/12*
U.S. Cl. 403—133 **1 Claim**

1. A ball and socket joint having a relatively low resistance to rotation and to oscillation within a first portion of a range of oscillatory movement and a relatively high resistance to oscillation within a second portion of the range of oscillatory movement, said ball and socket joint comprising a metal socket housing having first surface means for defining a metal seat having the configuration of a portion of a sphere and second surface means for defining an opening in the housing extending through a central portion of the seat, a metal ball stud having a spherical head end with a center of curvature which is coincident with the center of curvature of said metal seat, said ball stud having a shank extending through the opening in said metal seat, said shank having a cross sectional area which is substantially smaller than the cross sectional area of the opening in said metal seat to accommodate oscillation of said shank through a relatively large range of movement prior to engagement of said shank with said second surface means, a movable bearing disposed between the outer surface of the spherical head end of said ball stud and said metal seat, said bearing including a movable one-piece metal shell having an outer side surface with the configuration of a portion of a sphere having a center of curvature which is coincident with the center of curvature of said metal seat, said bearing further including a one-piece inner layer of polymeric material connected with said metal shell for movement therewith relative to said socket housing, said inner layer having an inner side surface with the configuration of a portion of a sphere having a center of curvature which is coincident with the center of curvature of said metal seat, said bearing including third surface means for defining an opening extending through a central portion of said



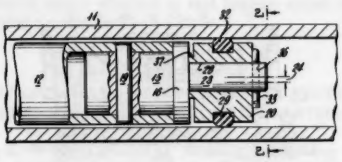
bearing, said opening through said bearing having an area which is substantially smaller than the area of the opening in said metal seat and which is substantially greater than the cross sectional area of said shank to accommodate oscillation of said shank through the first portion of the range of oscillatory movement without abutting engagement of said shank with said third surface means and to enable said shank and said bearing to move together through the second portion of the range of oscillatory movement after said shank has moved into abutting engagement with said third surface means and prior to abutting engagement of said shank with said second surface means, said polymeric inner layer of said bearing being disposed in abutting engagement with said spherical metal heat end of said ball stud and having a relatively low coefficient of friction to provide a relatively low resistance to rotation of said ball stud about a central axis of said shank and to provide a relatively low resistance to oscillation of said ball stud through the first portion of the range of oscillatory movement, said metal shell of said bearing being disposed in abutting engagement with said metal seat and having a relatively high coefficient of friction to provide a relatively high resistance to oscillation of said ball stud through the second portion of the range of oscillatory movement, and a preload bearing disposed between said socket housing and said spherical head end of said ball stud at a location which is opposite from said shank when said ball stud is in a central portion of the range of oscillatory movement, said preload being including surface means disposed in abutting engagement with the head end of said ball stud to urge the head end of said ball stud toward said seat.

4,324,502

LOCKING MECHANISM FOR TELESCOPIC TUBING

Robert A. Pickles, Bencon, N.Y., assignor to Texaco, Inc., White Plains, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,870
Int. Cl.³ F16B 7/14
U.S. Cl. 403—104 2 Claims



1. Locking mechanism for use with telescopic tubing having an outside tube and an inside tube, comprising

concentric means for providing radial support to the inside of said inside telescopic tube,

means for attaching said concentric means to said inside tube for rotation therewith,

cylindrical means having an outside diameter less than the inside diameter of said outside telescopic tube and including a peripheral groove thereon, with an O-ring in said groove, and

eccentric means for attaching said cylindrical means to said concentric means, comprising

a shaft integrally attached to said concentric means for rotatably supporting said cylindrical means,

said shaft being located with the axis thereof parallel to but offset from the axis of said concentric means, and

a hole through said cylindrical means for receiving said shaft,

said hole having the axis thereof offset from the axis of said cylindrical means the same amount as said shaft axis offset, and

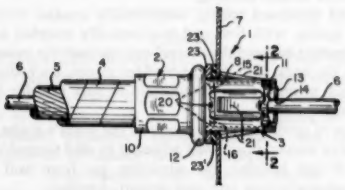
a reduced cylindrical portion on one end of said cylindrical means providing an anti-friction shoulder for engagement with said concentric means.

4,324,503

TWO-PIECE ANCHORAGE DEVICE

Warren E. Sevrence, Adrian, Mich., assignor to Acco Industries, Inc., Bridgeport, Conn.

Filed Dec. 21, 1979, Ser. No. 105,914
Int. Cl.³ F16B 9/00
U.S. Cl. 403—197 7 Claims



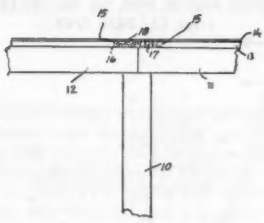
3. A two-piece anchorage device for securing a cable conduit with respect to a wall opening, said device including a tubular body piece adapted to extend through a wall opening and to be secured to the outer periphery of a cable conduit where said tubular body piece comprises a collar adapted to operatively engage a side of said wall opening, a lower body piece portion connected to one side of said collar and adapted to extend longitudinally along the cable conduit and an upper body portion connected to a side of said collar opposite said lower body portion having a groove adjacent said collar between the upper body portion and said collar with a wall of said groove forming a radially extending shoulder, and an anchor clip piece surrounding and fixed to said upper body portion including a plurality of depressible prongs adapted to engage a side of a wall opening opposite said collar whereby relative movement of said cable conduit with respect to said wall opening is prevented and including a plurality of stops engaging said shoulder to prevent longitudinal movement of said clip piece with respect to said body piece in a direction away from said collar.

4,324,504

METHOD OF SEALING BRIDGE DECK JOINTS

Richard L. Cottingham, Piltdown; David J. Thorpe, Eastbourne, and Eric Bickerstaff, Seaford, all of England, assignors to Thormack Sealants Limited, Uckfield, England

Continuation of Ser. No. 925,156, Jul. 17, 1978. This application Feb. 12, 1980, Ser. No. 120,849
Claims priority, application United Kingdom, Jul. 22, 1977, 30990/77; Oct. 12, 1977, 42544/77; Nov. 30, 1977, 49968/77
Int. Cl.³ E01C 11/02
U.S. Cl. 404—74 8 Claims



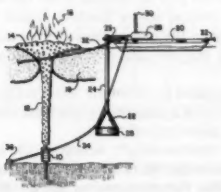
1. A method of sealing a bridge deck joint in which the bridge deck members comprise a concrete base and a road surfacing material, said method comprising the steps of providing a channel in the road surfacing material at the location of the joint, the channel extending through the full depth of the road surfacing material across the width of the bridge, and filling the channel substantially completely with a flexible composition of chips of stone aggregate in a rubberized binder, said binder consisting mainly of bitumen, pitch, pitch-tar or tar together with rubber wherein the chips occupy 40 to 70% by volume of the composition, and said chips of stone aggregate being all of substantially the same mesh size.

4,324,505

SUBSEA BLOWOUT CONTAINMENT METHOD AND APPARATUS

Dillard S. Hammett, 3729 Alta Vista La., Dallas, Tex. 75229

Filed Sep. 7, 1979, Ser. No. 73,367
Int. Cl.³ E02B 3/00; E02D 23/00
U.S. Cl. 405—60 15 Claims



1. Apparatus for containment of hydrocarbons flowing from a subsea well blowout comprising:

support means comprising a floating vessel;

an elongated conduit supported by said vessel at an upper end of said conduit;

a funnel having a small end connected to the lower end of said conduit and a large end directed downwardly toward the sea floor;

positioning means for positioning said vessel so that said large end of said funnel is disposed over said well blowout for substantially capturing the flowstream of hydrocarbons emanating from said well blowout;

means forming a connection between said vessel and said conduit to permit limited movement of said conduit and said funnel with respect to said vessel upon capturing at least a portion of said flowstream by said funnel to permit said funnel to be pulled into position over said well blowout by said flowstream; and

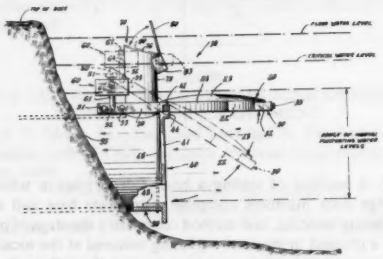
receiving means connected to said upper end of said conduit and carried by said vessel for receiving hydrocarbons recovered from said well blowout through said funnel and said conduit.

4,324,506

SELF-REGULATING FLUID CONTROL VALVES

Thomas J. Steinke, 1673 Melville Ave., Fairfield, Conn. 06430

Filed Aug. 28, 1980, Ser. No. 182,129
Int. Cl.³ F02B 7/40
U.S. Cl. 405—96 **18 Claims**



17. An improvement in water control valves of the type comprising a door pivotally mounted to the input end of a generally horizontal conduit leading out of a body of water, the door being held in an open position permitting flow through the water conduit and freely pivotal to a closed position blocking flow through the water conduit, wherein when there exists a full and swift flow through the water conduit and the door is closed, the freely pivotal transition of the door from its open to its closed position is rapid and a column of water continues to move through the water conduit after the water is closed, thereby drawing a vacuum behind the door and subjecting the door to a large and potentially damaging pressure differential, the improvement comprising a vacuum break including,

(A) an air pipe intersecting the conduit connecting the two bodies of water adjacent the door pivotally mounted thereto, the air pipe extending from the conduit to the air above the critical water level at which the door closes, whereby when the door closes the vacuum break permits air to enter the conduit immediately adjacent the closed door, and

(B) a float operated lid pivotally mounted to the open end of the air pipe and a counterweight float mounted to the lid across the pivot axis of the lid,

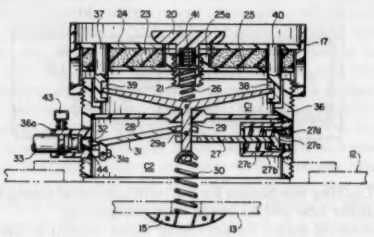
whereby the counterweight action of the counterweighted float maintains the lid in an open position when the water level is below the open end of the air pipe and the float action of the counterweighted float pivots the lid to a closed position blocking the open end of the air pipe after the door closes and before the water level rises to the open end of the air pipe.

4,324,507

AUTOMATICALLY-CONTROLLED BUOYANCY VEST

Shane Harrah, 700 Coleman Ave., Apt. 7, Menlo Park, Calif. 90425

Filed Apr. 14, 1980, Ser. No. 139,812
Int. Cl.³ B63C 11/02
U.S. Cl. 405—186 **21 Claims**



1. Buoyancy regulating apparatus for scuba divers, and the like, comprising:

a stationary plate;

a movable plate, spaced apart from said stationary plate;

a sheet of compressible material similar to a diver's wetsuit material, positioned between and in contact with said stationary plate and said movable plate;

a first tensioned spring with first end coupled to said movable plate, with said compressible sheet being operatively associated with said first spring such that as said movable plate moves toward said stationary plate, the tension in said first spring increases;

a movable connecting bar mechanically coupled to the second end of said first spring;

a hollow housing, with said stationary plate positioned at first end of said housing, that contains said compressible sheet, said movable plate, said first spring, and said connecting bar in the housing interior;

a flexible, waterproof diaphragm, through which said connecting bar passes, that is attached to the interior side walls of said housing, for defining a first chamber, which is open to the surrounding water, between said stationary plate and said diaphragm, and for defining a gas-filled second chamber between said diaphragm and the second end of said housing;

flexible bladder means, with front wall of said bladder means connected to said second end of said housing such that gas can flow between said bladder means and said second chamber of said housing;

a second tensioned spring, substantially coaxial with said first spring, with first end mechanically coupled to said connecting bar and the second end operatively associated with the back wall of said bladder means, such that said second spring's tension increases as said bladder means expands;

a source of compressed gas, such as the diver's scuba tank;

first valve means, positioned adjacent to said second chamber of said housing, for admitting gas from said compressed gas source into said second chamber;

a first rotatable valve control arm, operatively associated with said connecting bar and with said first valve means, for opening and closing said first valve means in response to movement of said connecting bar toward or away from said compressible sheet, such that gas flows from said gas source through said second chamber and then into said bladder means whenever said compressible sheet or said bladder means is further compressed;

second valve means, positioned adjacent to said second chamber of said housing, for releasing gas from said second chamber into the surrounding water;

a second rotatable valve control arm, operatively associated

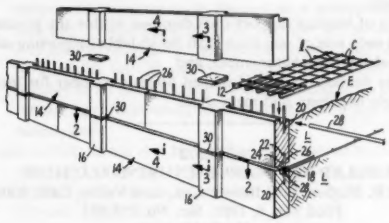
with said connecting bar and with said second valve means, for closing and opening said second valve means in response to movement of said connecting bar toward or away from said compressible sheet, such that gas flows from said bladder means through said second chamber and then out to the surrounding water whenever said compressible sheet or said bladder means further expands; and suspension means attached to said bladder means for supporting the apparatus on a diver.

4,324,508

RETAINING AND REINFORCEMENT SYSTEM METHOD AND APPARATUS FOR EARTHEN FORMATIONS

William K. Hilfiker; Harold O. Hilfiker, and William B. Hilfiker, all of Eureka, Calif., assignors to Hilfiker Pipe Co., Eureka, Calif.

Filed Jan. 9, 1980, Ser. No. 110,763
Int. Cl.³ E02D *5/00*
U.S. Cl. 405—284 **4 Claims**



1. A retaining system for an earthen formation, said system comprising: a plurality of elongate precast face panels stacked in generally horizontally disposed relationship to provide a wall, said panels including complementally engageable means to maintain the panels in aligned stacked condition and at least certain of the panels having a recessed shoulder formed in the upper surface thereof and a plurality of pin members extending from the shoulder; anchor mats disposed within the earthen formation behind the stacked face panels, said mats each comprising a plurality of elongate tension rods extending from the panels and a plurality of cross rods welded to and extending transversely of the tension rods in spaced relationship to one another; tension rod extensions on at least certain of said mats extending over and within the confines of the shoulder; and a retention rod carried by the extensions and engaged with the pin members to secure the mats along the length of the panels.

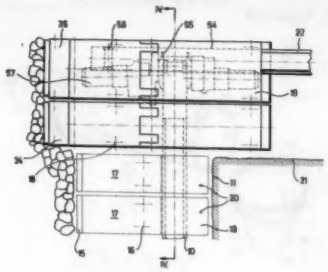
4,324,509

MECHANIZED LONGWALL SYSTEM FOR MINING

György Ignatko; Zoltan Ilyes, both of Budapest; Ferenc Nemeth, Mor; Matyas Racz, Környe; Albert Varga, and Jenö Varro, both of Oroszlany, all of, Hungary, assignors to Kozponti Banyaszati Fejlesztesi Intezet, Budapest and Oroszlanyi Szenbanyak, Oroszlany, both of, Hungary

Filed May 21, 1980, Ser. No. 151,774
Claims priority, application Hungary, May 23, 1979, KO 2993
Int. Cl.³ E21D *23/00*
U.S. Cl. 405—299 **6 Claims**

1. A mechanized longwall system for mining including face roof supporting units disposed adjacent each other along the longwall, fluid operated advancing cylinders connecting said roof supporting units to a face transport track laid over the length of the longwall, each supporting unit comprising a floor element and a roof element, hydraulic props supporting said roof elements by coupling to said floor elements, a drift transport track mounted at and perpndicular to one end portion of the face transport track for extending into the drift in the conveying direction, said system further comprising at least two drift supporting units adjoining said face roof supporting units and located in the drift adjacent to each other, said drift supporting units each having a supplementary floor element, a linkage connecting each of said drift supporting units to the front end of the floor element thereof, a supplementary prop, linkages connecting said supplementary prop between the supplementary floor element and the front end of the roof element, the floor element and supplementary floor element of the outermost drift supporting unit of the said two adjacent drift supporting units lying further from the face are constructed for receiving a take-over section and a reversing unit



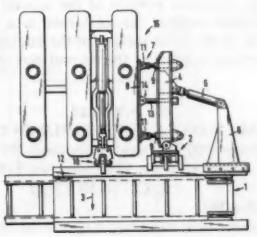
of the drift transport track, a transfer unit formed at the end of the face transport track for projecting over the take-over section of the drift transport track, a guide system including said supplementary floor element of the outermost drift supporting unit for guiding the transfer unit in the longitudinal direction of the drift transport track and a fluid operated advancing cylinder, one end of said advancing cylinder being hinged onto the transfer unit, the other end of said cylinder being connected to the floor element and/or to the supplementary floor element of said outermost drift supporting unit.

4,324,510

APPARATUS FOR SUPPORTING A MINE ROOF SUPPORT ASSEMBLY

Hans-Joachim Dreher, Dortmund-Asseln, and Kunibert Becker, Werl, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

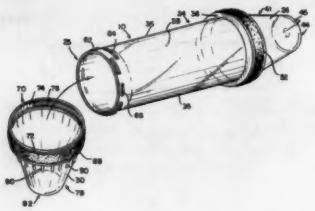
Filed Apr. 25, 1980, Ser. No. 143,721
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2917047
Int. Cl.³ E21D *15/44*
U.S. Cl. 405—291 **12 Claims**



1. Apparatus for supporting the lowermost roof support unit of a series of roof support units positioned side-by-side on the goaf side of a conveyor in an inclined longwall working, the apparatus comprising a beam mounted on the conveyor for pivotal movement in a plane parallel to the floor of the working, means for pivoting and holding the beam in any given position relative to the conveyor, a support device for engage-

ment with the lower side of the lowermost roof support unit, said support device being connected to and being movable towards, and away from, the beam, and means for holding the support device and the beam at any given spacing within a predetermined range of spacings.

4,324,511
CARRIER FOR PNEUMATIC TUBE SYSTEMS
John T. Irish, Indianapolis, Ind., assignor to J. I. Industries, Incorporated, Indianapolis, Ind.
Filed Mar. 6, 1980, Ser. No. 127,600
Int. Cl.³ B65G *51/06*
U.S. Cl. 406—189 **8 Claims**



4. A carrier for pneumatic tube systems of the type which include a passageway and a controlled fluid source for moving the carrier through the passageway, comprising a first frustoconically shaped end section; a second frustoconically shaped end section integrally formed with an elongated intermediate section; each end section including a domed distal portion, a proximal portion having an outer surface with a cross-sectional dimension for engaging the inner surface of the passageway, and a tapered intermediate portion therebetween; the intermediate section having an outer surface with a cross-sectional dimension which is smaller than the outer cross-sectional dimension of the proximal portions of the end section and an inner surface with a uniform cross-sectional dimension; the first end section being removable to allow access to the intermediate and second end sections; cooperating threads formed on an inner surface of the first end section and on the outer surface of the intermediate section for securing the first end section to the intermediate section; the threads on at least one of the first end section and the intermediate section including a plurality of long and short segments intermittingly spaced apart to reduce surface friction between the cooperating threads; at least the first end section including a plurality of spaced-apart ribs extending longitudinally from the proximal portion toward the distal portion for reinforcement of the intermediate portion thereof; and a structurally reinforced area between the proximal portion of the second end section and the intermediate section, the reinforced area being formed by an extension of the inner surface of the intermediate section to the intermediate portion of the second end section.

4,324,512
PORTABLE DRILL WITH BUILT-IN CHUCK KEY
John A. Siroky, 809 Madiera, Shorewood, Ill. 60436
Filed Mar. 31, 1980, Ser. No. 135,705
Int. Cl.³ B23B *45/00*
U.S. Cl. 408—240 **13 Claims**

1. In a power drill including a chuck for holding a working tool the combination comprising:

a housing;

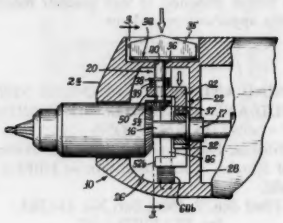
a motor-driven main shaft mounted in said housing for rotation by a driving motor;

a main shaft locking mechanism disposed within said housing for engaging said main shaft to selectively lock the main shaft;

a chuck key permanently slidably mounted in said housing and engageable with the chuck, said chuck key being moveable in said housing between an operating and a nonoperating position;

spring biasing means for normally retaining said main shaft locking mechanism and said chuck in a nonoperating position; said main shaft locking mechanism including

an inverted substantially U-shaped bracket member slidably

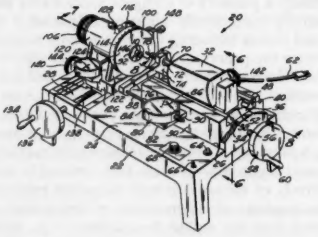


supported within said housing and straddling said main shaft;

a pair of bearing support rods disposed within the housing on each side of said main shaft for slidably supporting said U-shaped bracket member, and

means formed on said U-shaped bracket member for lockingly engaging said main shaft.

4,324,513
TUBULAR KEY MANUFACTURING MACHINE
Donald R. Hughes, 2600 Brower Ave., Simi Valley, Calif. 93065
Filed Feb. 8, 1980, Ser. No. 119,997
Int. Cl.³ B23C *3/35*
U.S. Cl. 409—82 **3 Claims**



1. A machine for manufacturing keys comprising:

a base;

cutting means including a cutter rotatable about a first axis, said cutting means being movably mounted by first movement means on said base, said first movement means comprising a first crank assembly and a first dovetail slot assembly, manual operation of said first crank assembly causes movement of said cutting means within said first dovetail slot assembly parallel to said first axis;

key support means movably mounted by second movement means on said base, said second movement means comprising a second crank assembly having a second dovetail slot assembly, manual operation of said second crank assembly causes movement of said tubular key support means within said second dovetail slot assembly along a second axis transverse to said first axis, a tubular key mounted within said key support means parallel to said second axis, to tightly hold said tubular key in a desired position, said key support means including a housing and an indexing plate assembly, said indexing plate assembly being pivotable about a pivot axis upon said housing, the longitudinal center axis of the said tubular key coinciding with said pivot axis, said indexing plate including a mea-

suring scale to facilitate the accurate locating of said indexing plate in a certain desired pivotal position relative to said housing to thereby facilitate the forming of a plurality of spaced-apart longitudinal grooves about the periphery of said tubular key, said indexing plate including locking means for fixing of said indexing plate at a particular established position in respect to said key support means, said locking means comprising a locating pin lock and a separate screw engaging lock, said locating pin lock to fix the position of said indexing plate at any one of several pre-established positions, said screw engaging lock to fix the position of said indexing plate at any position;

a first measuring indicator connected to said first movement means, said first measuring indicator having a first measurement scale formed on a first indicator face and a first pointer to be movable across said first measurement scale, said first measurement scale to be manually moved relative to said first pointer to be setable at an initial (zero) measuring value when said cutting means has been moved longitudinally to just touch the said tubular key;

a second measurement indicator connected to said key support means, said second measurement indicator having a second measurement scale formed on a second indicator face and a second pointer to be movable across said second measurement scale, said second measurement scale to be manually moved relative to said second pointer to be settable at an initial (zero) measuring value with the said tubular key transversely moved to just touch said cutting means; and

said cutting means is to be longitudinally moved to a desired value and the said tubular key is also to be moved to a desired transverse value causing a groove to be cut within the said tubular key.

4,324,514

ROUTER GUIDE APPARATUS FOR CUTTING PRINTING PLATES

Mark Craven, 6691 Melbourne Dr., Huntington Beach, Calif. 92646

Continuation-in-part of Ser. No. 16,361, Mar. 1, 1979, abandoned. This application Mar. 31, 1980, Ser. No. 135,857

Int. Cl.³ B23C *1/20*

U.S. Cl. 409—179 **7 Claims**

1. Router apparatus for cutting printing plates to outlines which include arcuate and linear segments, comprising:

a router head with a router bit;

a mounting block having retaining means retaining said router head and having vertical adjusting means to adjust the depth of cut of said bit;

a mounting bar;

a rod;

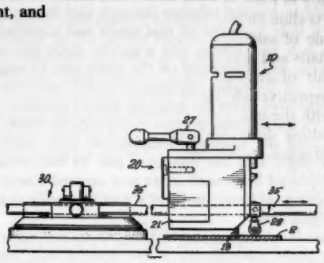
means in said mounting block to fasten it detachably to a said mounting bar, said router head, mounting block, and mounting bar forming an assembly,

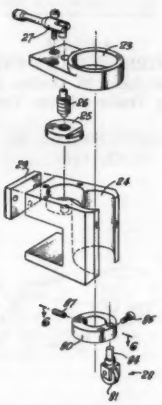
said mounting bar having at least one opening fittable slidably over said rod;

a first center head comprising a suction-cup base and a first top portion mounted rotatably thereon for substantially 360° pivotal movement and having an opening fittable over a said rod, and means to clamp said rod therein to prevent sliding;

at least one second center head comprising a suction-cup base and a second top portion having a second opening fittable over a said rod,

a said assembly being attachable to a said rod acting as a radius rod on a said first center head to cut a said arcuate segment, and





a said assembly being slidable along a said rod held in a said second opening in a said second center head, to cut a said linear segment.

4,324,515

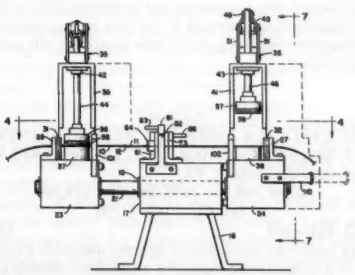
DIE SHEAR APPARATUS FOR TRIMMING WIRE WELD BULGES

John W. Ehling, LaGrange Park, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,731

Int. Cl.³ B23D *1/02*

U.S. Cl. 409—300 **3 Claims**



1. An apparatus for removing a bulbous portion formed on a strand member, which comprises:

a stationary frame;

a pair of shafts slidably mounted in and extending horizontally in parallel relation through said frame;

a first slide mounted on said shafts and positioned on a first side of said frame, and a second slide mounted on said shafts and positioned on the other side of said frame;

a pair of clamping devices mounted individually on the respective slides for gripping spaced sections of the strand with the bulbous portion interposed between the clamps;

a cutting die having a longitudinal bore extending therethrough, said die having a pair of end surfaces axially displaced from each other and tapered toward and intersecting said bore to form a pair of axially spaced cutting edges; and

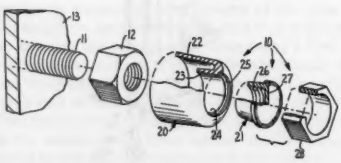
means for securing said cutting die to said stationary frame to shear successively a first section and then a second section of said bulbous portion upon movement of the clamps and slides to advance the bulbous portion into said die.

4,324,516

TIRE SECURITY CAP

Bernard S. Sain, and James M. Dudley, both of Jacksonville, Fla., assignors to Trailer Marine Transport Corporation, Jacksonville, Fla.

Filed May 27, 1980, Ser. No. 153,081
Int. Cl.³ F16B *31/02*
U.S. Cl. 411—5 **4 Claims**



1. A lug nut cap attachment for detecting the removal of a wheel lug nut comprising: a frangible shroud having an outer skirt and an integral internal coaxial collar, said outer skirt defining a rear opening and housing for receiving a lug nut within said skirt and a front opening that provides a coaxial circular recess; means for attaching said shroud to a lug nut and comprising a sleeve having an internally threaded surface extending from one end for engagement with the exterior thread of a lug nut upon which said shroud is to be mounted, the threaded extension of said sleeve being adapted to be received through the front opening and coaxial collar of said shroud to be threadably engaged with a housed lug nut, said sleeve having a circular flange circumferentially larger than the internal circumference of said coaxial collar but receivable within the circular recess of said shroud; and a breakaway nut integrally formed with said sleeve as an axial extension of said circular flange, said breakaway nut projecting forwardly of the front opening of said shroud to provide an engageable means for threadably tightening said sleeve onto a lug nut and attaching said shroud.

4,324,517

PANEL FASTENER ASSEMBLY WITH RETAINER RING

Ervin J. Dey, Sante Fe Springs, Calif., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Jun. 16, 1980, Ser. No. 159,334
Int. Cl.³ F16B *41/00*
U.S. Cl. 411—353 **12 Claims**

1. An improved quick-acting fastener assembly for joining a panel to a substructure including a grommet assembly having an annular body which is adapted to be secured to the panel and an annular resilient retainer having a split therein, said annular body being adapted to receive said retainer; a receptacle assembly which is adapted to be connected to the substructure including a threaded stud; and a threaded sleeve bolt having a head at one end formed to abut the panel and adapted to threadably engage said stud, said sleeve bolt having an annular groove adjacent the other end thereof and being adapted to be engaged by said retainer at said groove to secure said sleeve bolt to said grommet assembly when said sleeve

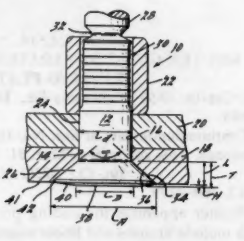
bolt is threadably disengaged from said stud, the improvement characterized in that said annular body includes an annular cavity which is adapted to receive said retainer, said cavity having an outwardly sloping surface forming an angle x greater than zero degrees with respect to a plane perpendicular to the centerline of said body.

4,324,518

DISH COMPENSATING FLUSH HEAD FASTENER

Richard D. Dixon, El Toro, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Jul. 13, 1979, Ser. No. 57,341
Int. Cl.³ F16B *19/05*
U.S. Cl. 411—361 **8 Claims**



1. In a two piece shear type fastener for joining together a plurality of workpieces including a pin having a preformed head provided on one end thereof, a shank portion provided with a plurality of grooves and one piece circumferentially continuous collar means adapted to engage one of the outer surfaces of said plurality of workpieces and to cooperate with said grooves to join said plurality of workpieces together, said preformed head being subjected to an axially directed installation tensile loading resulting in part from a pulling force and from the engagement of said collar means with said one surface of said plurality of workpieces, said preformed head comprising a sidewall including a generally concially shaped portion adapted to be received in and substantially conform to the shape of a prepared countersunk opening in the other outer surface of said plurality of workpieces, a centrally disposed raised axially outwardly facing surface portion and an annular beveled radially outwardly extending surface portion surrounding said raised surface portion and forming an intersection with said sidewall, said intersection being adapted to be positioned in substantially coplanar relationship with said

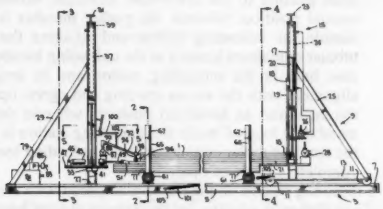
other outer surface of said plurality of workpieces, said raised surface portion being positioned axially outwardly from said other outer surface a distance proportioned to the shear stress of the pin material and to the difference between a predetermined anticipated peak installation loading and the desired installation fastener head strength divided by the anticipated peak installation load so that said preformed head may operate to relieve a portion of said axially directed installation load whereby said raised surface portion is operative to substantially eliminate dishing of said head during installation loading.

4,324,519

WOOD HANDLING MACHINE

Robert L. Moore, P.O. Box 836, North Little Rock, Ark. 72115

Filed Feb. 27, 1981, Ser. No. 239,014
Int. Cl.³ B27B *31/00*
U.S. Cl. 414—28 **9 Claims**



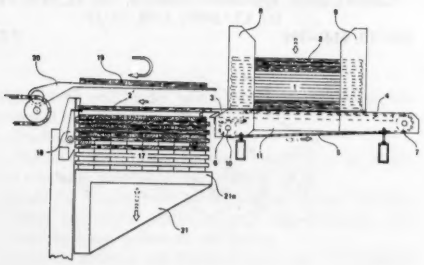
1. A wood handling machine for handling stacked layers of board lumber to facilitate marking the boards, comprising a support bed for supporting a stack of boards in layers, clamping means to clamp the stacked layers of boards to hold the layers in alignment, pushing means to move at least one layer of boards at a time to uncover the adjacent layer to facilitate marking said adjacent layer, means to limit the distance said layer of boards is moved, stop means to prevent movement of said adjacent layer, and fluid pressure means to operate said clamping means, pushing means and stop means.

4,324,520

METHOD OF LAYING-OUT SPACING STICKS, AND APPARATUS FOR CARRYING OUT THE METHOD

Jan E. Kjellberg, Norra Bäckvägen 40, 821 00 Bollnäs, Sweden

Filed Jan. 15, 1980, Ser. No. 112,256
Claims priority, application Sweden, Jan. 17, 1979, 7900439
Int. Cl.³ B65G *57/18*
U.S. Cl. 414—42 **11 Claims**



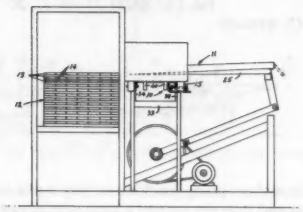
1. A method in the stacking of layers of lumber to form a stack by inserting spacing sticks between various lumber layers at right angles to the longitudinal axis of said layers, laying means carrying said lumber layers being arranged to move towards, over and away from a stack support surface on which the lumber layers are placed, and spacing sticks being inserted between separate lumber layers by movable means which feeds said spacing sticks substantially parallel with the direction of return movement of the laying means, wherein the movable means while engaging one end of a spacing stick feeds said stick towards the stack support layer substantially simultaneously with the movement of the laying means in a manner such that spacing sticks and lumber layers move in mutually opposite relative movements at different levels and out of contact with each other during at least part of a stacking sequence.

4,324,521

STICKER PLACING APPARATUS

Sidney L. Lunden, and Larry A. Gillingham, both of Spokane, Wash., assignors to Lunden Industries, Inc., Spokane, Wash.

Filed Sep. 24, 1980, Ser. No. 190,449
Int. Cl.³ B65G *57/26*
U.S. Cl. 414—42 **11 Claims**



1. Sticker placing apparatus for use in conjunction with lumber stacking equipment for forming a stack of boards having a plurality of superimposed layers of elongated boards, in which selected layers are separated by stickers that are oriented transversely to the elongated dimension of the boards at desired sticker intervals along the length of the boards, said sticker placing apparatus comprising:

a frame adjacent the stack;

an elongated sticker distribution conveyor mounted on the frame and extending from a sticker magazine to a plurality of spaced sticker stations spaced along one side of the stack corresponding to the desired sticker intervals for receiving a plurality of stickers from the magazine means and distributing the stickers individually to the sticker stations alongside the stack;

a sticker transfer means movably mounted on the frame for removing stickers from the elongated sticker distribution conveyor and lifting the stickers upward and laterally to sticker transfer positions in which the stickers are positioned transverse to the elongated dimension of the boards in the stack;

sticker depositing means movably mounted on the frame for receiving the stickers at the sticker transfer positions and moving the stickers longitudinally over the stack and depositing the stickers between the selected layers of boards;

wherein the sticker transfer means includes:

an elongated carriage extending between the sticker stations and movably mounted on the frame for linear reciprocating movement on the frame substantially parallel with the elongated sticker distribution conveyor;

a plurality of sticker pickup assemblies mounted on the frame at spaced locations corresponding to the desired sticker intervals for reciprocating movement with the carriage in prescribed reciprocating paths between the sticker stations and the sticker transfer positions;

each of said sticker pickup assemblies being movably mounted on the carriage for vertical movement between the sticker stations and the sticker transfer positions;

drive means operatively connected to the elongated carriage for linearly reciprocating the carriage to move the sticker pickup assemblies in a forward stroke from the sticker

stations to the sticker transfer positions and move the sticker pickup assemblies in a return stroke from the sticker transfer positions to the sticker stations; and

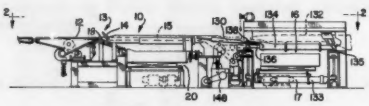
cam means mounted in the prescribed reciprocating paths of the sticker pickup assemblies for engaging the sticker pickup assemblies as the sticker pickup assemblies are moved in a forward stroke and moving the assemblies elevationally upward from the sticker stations to the sticker transfer stations to pick up the stickers at the sticker stations and to carry the stickers upward and laterally from the sticker stations to the sticker transfer positions.

4,324,522

METAL SHEET HANDLING MACHINE

Velio S. Buccicone, Portage, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.

Filed Mar. 4, 1980, Ser. No. 127,224
Int. Cl.³ B65H *29/62, 31/20*
U.S. Cl. 414—51 **10 Claims**



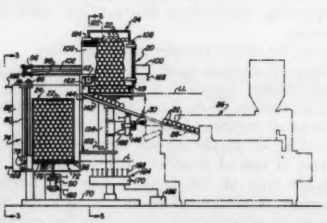
9. In a sheet piling machine having a pile supporting member, an end stop device and a back stop device, said back stop device comprising a sheet edge engaging forward face formed by a vertically disposed center plate member and hingedly connected wing forming side plate members adapted to be swung forwardly into angular relation relative to the center plate member, said plate members each having one or more apertures permitting the passage of an air stream, a conduit extending rearwardly of said plate members and to an air supply member and means forming air passageways connecting said conduit and said plate members so as to enable flow of air from said conduit through said passageways, said means forming said air passageways comprising chamber forming members secured on the back face of each of said wing forming side plate members which chamber members are hinged on an axis adjoining the opposite side edges of said center plate member and said means forming said passageways telescoping the end portion of said conduit.

4,324,523

SYSTEM FOR HANDLING TUBULAR CONTAINERS, INCLUDING APPARATUS AND CASES THEREFOR

William J. Zablocky, 312 Myers Ave., Hasbrouck Heights, N.J. 07604

Filed Apr. 25, 1980, Ser. No. 143,914
Int. Cl.³ B65B *69/00*
U.S. Cl. 414—131 **10 Claims**



1. Apparatus for unloading tubular containers from incoming cases within which the tubular containers are arranged in freely stacked rows, each container having a longitudinal axis and each case having an access opening and a longitudinally opposite egress opening, the unloading being such that the rows emerge from a case through the agress opening thereof and are delivered serially to a selected delivery point, said apparatus comprising:

a frame;

an unloading station on the frame;

holding means on the frame for holding a case at the unloading station with the case oriented such that the rows of tubular containers extend generally laterally and are stacked essentially altitudinally to include a first row located in an unloading location registered with the access opening and the egress opening of the case, and subsequent rows stacked beyond the first row and biased toward the unloading location, with the longitudinal axes of all of the tubular containers extending in a transverse direction;

pusher means on the frame juxtaposed with the unloading station and including a pusher member movable in directions parallel to the transverse direction between a retracted position, wherein the pusher member is located outside the unloading station and adjacent the row of tubular containers located at the unloading location in the case held in the unloading station and in longitudinal alignment with the access opening and egress opening of the case, and an advanced position, wherein the pusher member is located inside the unloading station in place of the row of tubular containers at the unloading location, to complete a cycle of operation;

a receiving station on the frame juxtaposed with the unloading station in position for receiving a row of tubular containers pushed out of the unloading station in response to advancement of the pusher member from the retracted position to the advanced position;

delivery means on the frame at the receiving station for moving the tubular containers received at the receiving station laterally relative to the longitudinal axes thereof until the tubular containers arrive at the delivery point; and

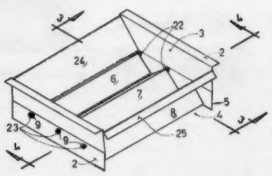
actuating means for actuating the pusher means through a plurality of cycles of operation to enable each subsequent row of tubular containers to be placed in the unloading location and to push each so-placed subsequent row of tubular containers from the case.

4,324,524

DUST RETENTION DEVICE

Jonathan D. Burston, Dalkeith, and Robert G. Henley, Bickley, both of Australia, assignors to Barrett Burston (Australia) Limited, Melbourne, Australia

Filed Jan. 31, 1980, Ser. No. 117,306
Claims priority, application Australia, Feb. 12, 1979, PD7654
Int. Cl.³ B65G *3/04, 65/32*
U.S. Cl. 414—291 **7 Claims**



1. A dust retention device for a passage to a container for particulate material, the dust retention means comprising

a plurality of openings,

a restrictor for each opening being mounted in close proximity to one another so as to normally restrict the respective opening,

and wherein each restrictor comprises an inverted V-shape cross-section shutter extending across the respective open-

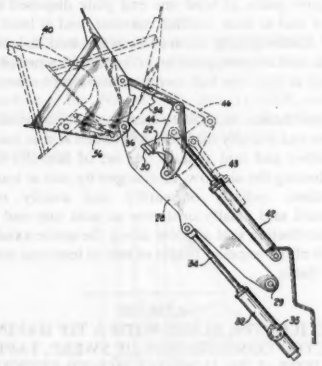
ing, each shutter comprising a central axis about which it is pivotally mounted and a leaf being an arm of the V-shape extending to each side thereof; the arrangement being such that unequal loading of the leaves will cause each restrictor to move when loaded by particulate material in excess of a predetermined amount independently of the other restrictors to open the respective opening and dump the material thereon and thereafter return to restrict the respective opening while the other restrictors not so loaded remain in restricting condition to restrict egress of dust through their respective said openings, wherein fixed directing means mounted above the shutters is provided to direct falling particulate material to unequally load one leaf with respect to the other leaf of selected shutters.

4,324,525

LOADING APPARATUS

John Lane, Youngstown, and Jerry C. Tu, Medina, both of Ohio, assignors to Anvil Attachments, Inc., Brecksville, Ohio

Filed Feb. 19, 1980, Ser. No. 122,132
Int. Cl.³ E02F *3/82, 3/86*
U.S. Cl. 414—699 **6 Claims**



1. For a front end loader having an elevatable boom, the improvement comprising:

(a) a loading bucket;

(b) a bucket support means pivotally attached to the boom, and rotatably supporting said loading bucket;

(c) means for rotating said bucket support means between rollback and dump positions, on a first rotational axis defined by hinge points on said boom;

(d) means for rotating said bucket between its own rollback and dump positions on a second rotational axis defined by hinge points on said bucket support means, said second rotational axis being laterally spaced from said first rotational axis.

(e) abutments, mounted to said boom, defining dump stops for said bucket support means; and

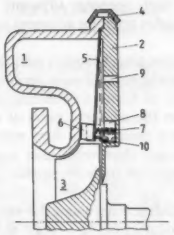
(f) said bucket support means including integrally formed bucket stops for said bucket.

4,324,526

APPARATUS FOR REGULATING A TURBO-SUPERCHARGER

Max Berchtold, Küssnacht, and Ernst Jenny, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 7, 1980, Ser. No. 119,399
Claims priority, application Switzerland, Mar. 16, 1979, 2500/79
Int. Cl.³ F01D *17/16*
U.S. Cl. 415—48 **16 Claims**



1. Apparatus for regulating a turbo-supercharger, comprising:

a housing, which housing includes a gas inlet for the turbo-supercharger;

a diaphragm having an inner periphery and an outer periphery, which diaphragm is connected at its outer periphery to the housing, said inner periphery of said diaphragm being movable between a first position and a second position relative to said housing; and

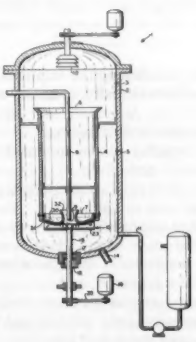
deflection means for deflecting a flow of gas within said inlet from a first flow angle to a second flow angle, said deflection means being provided at the inner periphery of the diaphragm.

4,324,527

CENTRIFUGAL PUMP

John W. Vanderveen, and Emil A. Malick, both of Bartlesville, Okla., assignors to Provesta Corporation, Bartlesville, Okla.

Division of Ser. No. 887,279, Mar. 16, 1978, Pat. No. 4,224,414. This application Apr. 11, 1980, Ser. No. 139,499
Int. Cl.³ F04D *29/24*
U.S. Cl. 415—213 B **12 Claims**



1. A centrifugal pump including:

a shaft;

bearing means rotatably mounting said shaft;

a plurality of vanes, means for mounting said vanes for rotation with said shaft with said vanes extending out-

wardly with respect to said shaft, each adjacent pair of vanes at least partially defining a flow path therebetween, each of said vanes having a first end adjacent said shaft and a second end spaced from said shaft outwardly of the respective said first end, each of said vanes having first and second side boundaries extending between the respective first and second ends, said first and second side boundaries of each vane being in diverging relation in a direction generally parallel to the longitudinal axis of said shaft from an inner radial position to an outer radial position along at least the outer portion of the length of the respective vane, each said pair of vanes at least partially defining an inlet opening adjacent said respective first ends and at outlet opening adjacent said respective second ends;

cover means extending between and cooperating with said first side boundaries and said second side boundaries of adjacent pairs of vanes to substantially enclose the flow paths between the adjacent pairs of vanes;

said cover means including a first member secured to said shaft for rotation therewith, said vanes being secured to the first member at their respective first side boundaries; and

the maximum distance between the respective first and second side boundaries being at least about 2 the times minimum distance between the first and second side boundaries.

4,324,528

AUTOMATIC REGULATING DEVICE FOR KEEPING CONSTANT THE SPEED OF WIND-POWERED PROPELLERS

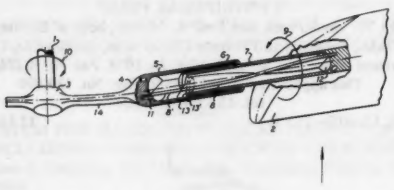
Sven G. W. Svenning, Partille, Sweden, assignor to Sven Svenning Konsult AB, Partille, Sweden

Continuation-in-part of Ser. No. 897,241, Apr. 18, 1978, abandoned, which is a continuation of Ser. No. 683,895, May 6, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 924,052

Claims priority, application Sweden, May 12, 1975, 7505407

Int. Cl.³ F03D 7/04

U.S. Cl. 416—132 B **11 Claims**



1. Apparatus for maintaining the rotational speed of a wind-powered propeller substantially constant at a preset value, comprising:

a hub rotatable about a first axis,

a plurality of propeller blades mounted on said hub and extending radially therefrom,

each of said blades having a root portion,

a hub portion secured to the hub,

a torsion spring connecting said root and hub portions such that the pitch of the blade is adjustable about a pivot axis substantially at right angles to the axis of rotation of the propeller, and

means for prestressing at least one portion of said torsion spring for presetting the pitch of said blade to a desired minimum value about said axis,

each of said blades having a curved mean profile chord and being so formed and disposed in relation to its pivot axis that the degree of torque exerted by wind forces acting on the blade against the action of said torsion spring is determined substantially solely by the curvature of the mean chord of the curved blade profile and substantially independently of any lifting force on the blade, the torque exercised by the wind forces being counterbalanced by the elastic torque from the prestressed torsion spring portion, whereby with increased wind force each blade is pivoted about its pivot axis from said preset pitch value to positions of increased pitch against the action of its torsion spring, and with decreasing wind force each blade is pivoted about its pivot axis towards said preset pitch value by the action of its torsion spring, such that the speed of the propeller is automatically maintained substantially constant over a range of variation in the wind force.

4,324,529

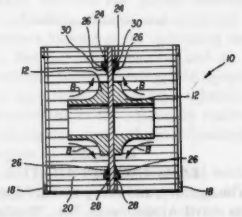
AXIAL-CENTRIFUGAL FLOW IMPELLER

Aubrey G. Nickels, Dunwoody, Ga., assignor to General Electric Co., Schenectady, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,981

Int. Cl.³ F04D 29/28

U.S. Cl. 416—187 **12 Claims**



1. In an axial-centrifugal flow impeller including a support plate, at least one hub member fixedly secured to one surface of said support plate, at least one end plate disposed axially upstream of said at least one hub member, and at least one set of impeller blades fixedly secured between said at least one end plate and said support plate and disposed in a peripheral array about said at least one hub member, the improvement comprising:

deflector means, secured to said one surface of said support plate and radially interposed between said at least one hub member and said at least one set of impeller blades, for deflecting the air flow, discharged by said at least one hub member, radially outwardly and axially rearwardly toward said axially upstream at least one end plate and redistributing said air flow along the entire axial length of each of the impeller blades of said at least one set of impeller blades.

4,324,530

HELICOPTER BLADE WITH A TIP HAVING A SELECTED COMBINATION OF SWEEP, TAPER AND ANHEDRAL TO IMPROVE HOVER EFFICIENCY

Evan A. Fradenburgh, Fairfield; William D. Jepson, Huntington, and Robert C. Moffitt, Seymour, all of Conn., assignors to United Technologies Corp., Hartford, Conn.

Filed Jan. 21, 1980, Ser. No. 114,131

Int. Cl.³ B63H 1/26

U.S. Cl. 416—228 **9 Claims**

1. A helicopter blade having high blade twist, a leading edge, a trailing edge, a root, a tip, a chord dimension extending between said edges, and being fabricated so that aerodynamic blade loading during rotor hover operation will induce slight torsional deflection of the blade to a preferred pitch position and thereby improve rotor performance and reduce the total power required to drive the rotor and including:

a root section adapted to be connected to a helicopter rotor hub for rotation therewith about an axis of rotation,

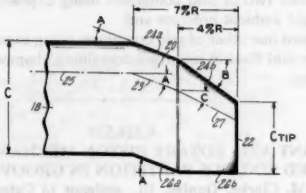
a central portion of selected aerodynamic shape connected to and extending outwardly from the blade root portion,

a tip portion connected to and extending outwardly from the blade central portion to establish a blade radius between

the axis of rotation and the blade tip, said blade tip portion being selectively shaped to improve helicopter hover performance by diminishing the intensity of the tip vortex generated during hover operation and directing the tip vortex away from the following blade to minimize interference therewith,

said tip portion extending for approximately 7% of blade radius,

said tip portion being swept rearwardly to reduce the velocity of the air in the direction of the tip local chord to thereby reduce blade tip loading and the strength of the tip trailing edge vortex generated in hover,



said tip portion also being tapered so that the chord dimension at its outboard end is approximately ½ the chord dimension at its inboard end to reduce tip portion area and to thereby further reduce blade tip loading and the strength of the tip trailing edge vortex generated in hover, and

said tip portion also being deflected downwardly throughout the outer 4% of blade radius so as to direct the shed trailing edge tip vortex away from the following blade in hover.

4,324,531

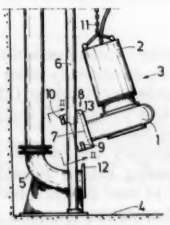
GUIDE APPARATUS FOR A SUBMERSIBLE PUMP

Hannu Sarvanne, Vantaa, Finland, assignor to Oy E. Sarlin AB, Kaivoksela, Finland

Continuation of Ser. No. 915,073, Jun. 12, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 108,404

Int. Cl.³ F04B *39/14*

U.S. Cl. 417—360 **1 Claim**



1. An improved apparatus employing a pump and a motor, these being combined to form a pump unit for submersion in a liquid, said unit being integrally mounted in a liquid tank, a pump delivery pipe and a vertical guide track, the latter guiding the pump unit and enabling it to be lowered into the liquid tank whereby said pump is provided with a delivery port which is connected with the delivery pipe, said pump unit being connected to a bipartite slide resting against the guide track, said slide having a recess therein for receiving a flange formed of said delivery pipe, wherein the improvement comprises, providing the guide track with two guides and said slide is defined by two lower projections and two upper projections between which said guides are disposed, said lower projection being positioned on the same side of said guides as said delivery port and said upper projection being positioned on the opposite side of said guides, whereby, uninhibited vertical travel of said pump with respect to said slide and guides is possible by tilting of said pump unit during lifting or lowering, and said slide being connected to the delivery port of the pump, whereby the lower projections are located below and the upper projections above the delivery port; and said projections during lowering of said pump unit guide said flange of said delivery pipe into said recess of said slide to urge registration between said delivery port and said delivery pipe.

4,324,532

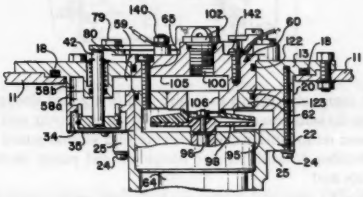
CARTRIDGE PUMP

James E. Knife, Dayton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 24, 1980, Ser. No. 114,926

Int. Cl.³ B67D *5/40*; F04R *39/14*

U.S. Cl. 417—360 **7 Claims**



1. A cartridge pump assembly in which a pump housing is positioned within a tank of liquid to be pumped and a motor-driven cartridge pump unit is removably received in said pump housing, the improvement comprising:

means in said pump housing defining an inlet and an outlet, cooperating inlet and discharge ports formed in said cartridge pump unit opening into said housing inlet and outlet,

valve means in said pump housing at said inlet movable between open and closed positions to permit flow of liquid to be pumped to flow through said inlet to the corresponding inlet port of the cartridge pump unit,

valve operator means on said housing for moving said valve means from said closed to said open position,

a bale-type handle on said cartridge pump unit for lifting said cartridge pump unit out of its seated position within said housing, said handle movable between a raised lifting position and a lowered storage position, and

said valve operator means being engaged by said handle only in said storage position to open said valve means.

4,324,533

UNIVERSAL GUARD

Earle E. Schroeder, New Richmond, and James E. Baker, Amelia, both of Ohio, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 15, 1980, Ser. No. 121,670

Int. Cl.³ F16P *3/00*; F16D *3/84*

U.S. Cl. 417—360 **1 Claim**

1. A guard for a rotating drive connection between a drive motor and a pump, comprising:

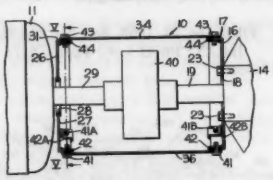
a first elongated semi-cylindrical guard sleeve member having one longitudinal edge deformed to provide a seat;

a second elongated semi-cylindrical guard sleeve member having one longitudinal edge deformed to provide a seat for the non-deformed longitudinal edge of said first guard sleeve member and its other longitudinal edge seated within said seat provided by said deformed longitudinal edge of said first guard sleeve member so that the assembled first and second guard sleeve members present a substantially smooth contour without protruding edges;

a circular pump motor end cap, said end cap having an annular flange extending parallel to the axis of the pump motor shaft toward said drive motor and an axial opening adapted to receive the pump motor shaft with adequate clearance;

fastening means to removably secure said pump motor end cap to the pump frame in position where the pump shaft may rotate freely without striking said pump motor end cap;

a circular drive motor end cap having an annular flange extending parallel to the axis of said pump motor shaft toward said pump frame and an axial opening adapted to fit over the drive shaft of the drive motor;



first removable means to secure said first guard sleeve member to said annular flange of said pump motor end cap;

second removable means to secure said second guard sleeve member to said annular flange of said pump motor end cap; and

means to removably secure said first and second guard sleeve members to said annular flange of said motor end cap, whereby said guard is secured solely to the frame of the pump and encloses the rotating drive connection between the motor and pump in extended cantilever fashion.

4,324,534

POWER SUPPLY APPARATUS

Robert L. Sharkey, Paisley, England, assignor to Andrew Master Hones Limited, Paisley, England

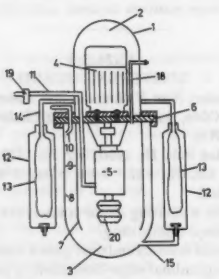
PCT No. PCT/GB79/00086, § 371 Date Jan. 26, 1980, § 102(e) Date Jan. 23, 1980, PCT Pub. No. WO79/01136, PCT Pub. Date Dec. 27, 1979

PCT Filed May 29, 1979, Ser. No. 189,833

Claims priority, application United Kingdom, May 26, 1978, 23266/78

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—414 **7 Claims**



1. Power supply apparatus having

a housing having an external wall,

a gas-containing chamber in the housing,

a motor in said gas-containing chamber,

a fluid-containing chamber in the housing, the fluid being different from said gas,

a pump in said fluid-containing chamber for pressurizing said fluid,

said pump being drivably connected to said motor,

inlet and outlet means for said fluid-containing chamber and extending through the housing wall,

pressure-equalizing means for altering the pressure of said gas in said gas-containing chamber and of said fluid in said fluid-containing chamber in response to changes in ambient pressure external of the housing,

said pressure-equalizing means comprising a plurality of deformable gas-filled containers external of the housing in gas flow communication with each other and with said gas-containing chamber of the housing,

at least two of said containers being exposed externally to said ambient pressure and

at least one other of said containers being exposed externally to said fluid in said fluid-containing chamber of the housing.

4,324,535

SLANT AXIS ROTARY PISTON MECHANISM WITH FIXED SINUOUS PARTITION IN GROOVED ROTOR

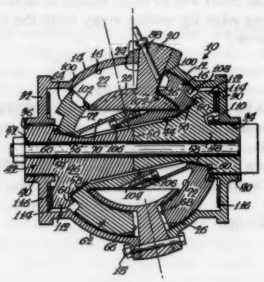
John M. Clarke, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00076, § 371 Date Jan. 24, 1980, § 102(e) Date Jan. 24, 1980, PCT Pub. No. WO81/02183, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 24, 1980, Ser. No. 149,351

Int. Cl.³ F01C *1/00, 19/00*

U.S. Cl. 418—51 **8 Claims**



1. A slant axis rotary piston mechanism comprising:

a shaft **(42)** having an angularly offset eccentric **(44)**;

a housing **(10)** defining a chamber **(22)** having a generally concave spherical portion **(16)** and journalling said shaft and containing said eccentric;

a peripheral, generally sinuous wall **(20, 24, 26)** for said chamber extending radially toward said eccentric and terminating in an inner convex spherical wall **(28)** extending about said eccentric;

a rotor **(62)** journalled on said eccentric having generally spherical exterior and interior parts **(64, 72)** and a peripheral, radial wall **(66, 68)**, said rotor wall facing said chamber wall and defining with said chamber wall and said housing at least two working volumes **(A, B, C, D, E, F)** whose volume varies as the shaft and rotor rotate relative to the housing;

seals **(100, 102)** carried by said rotor spherical parts immediately adjacent said radial wall and sealing engaging respective ones of said spherical portion and said spherical wall;

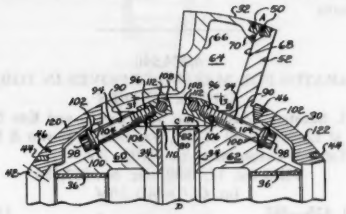
means **(108, 110)** for synchronizing relative movement between the shaft, the rotor and the housing; and

means **(90–96)** for directing working fluid into and out of said working volumes.

4,324,536
LINK-COUPLED ROTOR ASSEMBLY

Dane G. Shank, Painesville, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00645, § 371 Date May 28, 1980, § 102(e) Date May 28, 1980, PCT Pub. No. WO81/03519, PCT Pub. Date Dec. 10, 1981
PCT Filed May 28, 1980, Ser. No. 245,234
Int. Cl.³ F01C *1/00, 21/08;* F16D *1/02*
U.S. Cl. 418—53 4 Claims



1. A structure comprising:

first and second members (**60,62**) brought into abutment at a common interface (ABCD) with each other by movement toward each other along an axis (**84**);

link means (**110**) abutting each of said members about said interface and spanning said interface, said link means having first ends abutting said first member and second ends abutting said second member;

pivotable nut structures (**108**) journalled (**112**) in each of said ends;

linear passageways (**90**) in each of said members nominally aligned with said nut structures, said passageways each being at an acute angle to said axis and each terminating in a shoulder (**100**) at their ends remote from the corresponding nut structures; and

threaded, headed fasteners (**94**) having their heads (**98**) in operative engagement with corresponding ones of said shoulders and extending through the corresponding passageway and threadably received by the corresponding nut structure to tension the corresponding link means and hold said members in assembled relation.

4,324,537
ROTARY MACHINE WITH A PLURALITY OF ROTORS HAVING PERIPHERAL ROLLING CONTACT

Usher Meyman, 230 Ocean Pkwy., Brooklyn, N.Y. 11218

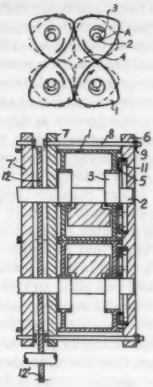
Filed Nov. 13, 1979, Ser. No. 93,609
Int. Cl.³ F01C *1/12, 17/02, 17/06*
U.S. Cl. 418—58 9 Claims

1. A rotary machine, such as a rotary combustion engine, a rotary pump and the like, comprising

a plurality of rotors rotatable about substantially parallel axes and having peripheral surfaces, said rotors being located relative to one another and each having a shape such that said rotors during the rotation about said axes roll by their peripheral surfaces one over the other without slippage and together bound at least one working cavity which is open at its both axial ends but is permanently closed peripherally by said peripheral surfaces of said rotors, each of said rotors having a shaft with an eccentric and being rotatable on said eccentric;

means for closing said cavity at said axial ends thereof and including two cover members located at both axial sides of said rotors;

a gear provided on each of said rotors so that said gear is arranged not on said shaft of said rotor but on said rotor itself, said gears having outer teeth; and

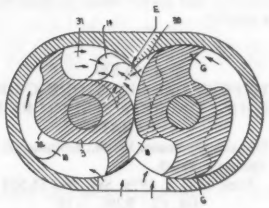


gears provided on said cover members and each having inner teeth, each of said gears of said rotors engaging with a respective one of said gears of said cover members.

4,324,538
ROTARY POSITIVE DISPLACEMENT MACHINE WITH SPECIFIC LOBED ROTOR PROFILES

Arthur E. Brown, Lake George, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 946,320, Sep. 27, 1978, Pat. No. 4,224,016. This application Apr. 11, 1980, Ser. No. 139,224
Int. Cl.³ F01C *1/20;* F04C *18/20*
U.S. Cl. 418—191 5 Claims



1. A rotary positive displacement machine adapted to handle a working fluid comprising: a casing structure having two intersecting bores, a first rotor mounted for rotation in one of said bores; a second rotor mounted for rotation in the other said bore; each rotor having both a main cross section profile and an end cross section profile; each main cross section profile being taken perpendicular to the axis of rotation of the rotor and midway along the axial width of the rotor; each end cross section profile being taken perpendicular to the axis of rotation of the rotor and near the axial end of the rotor; the main cross section profile of the first rotor having a main hub and two main lobes projecting radially outward therefrom; each main lobe of the first rotor having a concave face and a convex face; the main cross section profile of the second rotor having a main hub and two main lobes projecting radially outward therefrom and each main lobe having a concave face and a convex face; said main hub of the second rotor having two main grooves therein and each main groove being located angularly adjacent the concave face of a respective lobe; timing gears constraining said two rotors to rotate in timed relation; said main lobes on the first rotor being adapted to interengage with said main grooves in the main hub of the second rotor as the rotors

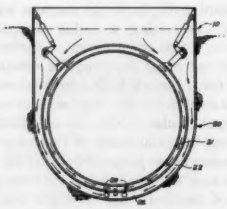
rotate; said main hub of the second rotor being profiled so as to rotate in sealing relation with said main hub of the first rotor during portions of each rotation of the rotors; said end cross section profile of the first rotor being defined by a flat end plate with two grooves therein; the outermost radius of said end plate being larger than an outermost radius of the main hub of the first rotor; said end cross section profile of the second rotor having a smaller diameter hub with two end lobes projecting radially outward therefrom; each said end lobe being adapted to interengage with a said groove in the end plate as the rotors rotate; said smaller diameter hub being profiled so as to rotate in sealing relation with the outermost radius of said end plate during portions of each rotation of the rotors; said casing structure having a lower pressure port for passage therethrough of the working fluid at lower pressure; said casing structure also having a higher pressure port for passage therethrough of the working fluid at higher pressure; said higher pressure port being located in an end wall of the bore containing said first rotor; said end plate and its grooves therein serving to alternately cover and uncover said higher pressure port so as to control the flow of the working fluid through the higher pressure port; said higher pressure port having an outer radius which is larger than the outermost radius of said main hub of the first rotor; the said outer radius of the higher pressure port being measured from the axis of rotation of the first rotor; said first rotor and said bore containing the first rotor forming a first chamber; said second rotor and said bore containing the second rotor forming a second chamber; each rotor being adapted to displace the working fluid within its respective said chamber as the rotors rotate and wherein the improvement is comprised by said main hub of said first rotor having given radius profiles, at angular locations thereon which are adjacent to said concave faces of said main lobes of said first rotor, and other radius profiles which are larger than said given radius profiles at angular locations thereon which are adjacent to said convex faces of said main lobes of said first rotor, to reduce an interchamber throttling loss, during flow of the working fluid between said two chambers; and said first rotor hub further has rounded convex transition sections which interconnect said given radius profiles with said other larger radius profiles.

4,324,539

CONCRETE PRESSURE MONITORING DEVICE FOR MONOLITHIC CONCRETE STRUCTURE FORMING APPARATUS

Richard W. Hanson, Spokane, Wash., assignor to R. A. Hanson Co., Inc., Spokane, Wash.

Filed May 3, 1979, Ser. No. 35,554
Int. Cl.³ B28C *7/16*
U.S. Cl. 425—59 **12 Claims**



1. In an apparatus for continuously forming an elongated monolithic concrete structure along a prepared soil surface within an excavation formed with walls converging downwardly and transversely to a bottom surface and with the apparatus having a distributor assembly including a forward upright bulkhead conforming to the transverse configuration of the excavation adapted to move longitudinally along the prepared soil surface, and an inner form member supported by the distributor at an elevation spaced from the excavation walls to transversely shape concrete fed into the distributor rearward of the bulkhead during longitudinal movement thereof; a pressure monitoring device, comprising:

pressure sensing means mounted to the distributor rearward of the bulkhead adjacent the bottom surface of the excavation for sensing pressure variance within the concrete rearwardly adjacent the bulkhead and between the inner form member and excavation bottom; and

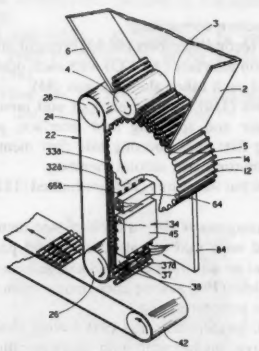
remote indicator means communicating with the pressure sensing means and responsive thereto for indicating pressure levels of the concrete adjacent the pressure sensing means.

4,324,540

APPARATUS FOR MAKING GROOVES IN TOBACCO SMOKE FILTERS

John H. Sexstone, Anchorage; Tom Lewis, and Ken Milliner, both of Louisville, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 11, 1980, Ser. No. 167,554
Int. Cl.³ A24D *3/04*
U.S. Cl. 425—385 **11 Claims**



1. A filter rod groove-making machine comprising:

(a) conveying means;

(b) means to feed filter rods to said conveying means;

(c) stationarily mounted heated groove-making means in preselected co-operating spaced relation with said conveying means, said groove-making means being transversely disposed in relation to movement of said conveying means whereby a groove is impressed into the filter rod as it is conveyed past the groove-making means; and

(d) receiving means in discharge relation with said conveying means.

4,324,541

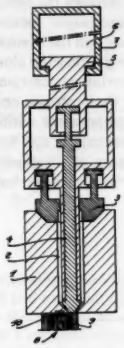
APPARATUS FOR MANUFACTURING AN OBJECT IN PLASTICS MATERIAL

Ennio G. Curetti, and Andre M. Collombin, both of Grand-Lancy, Switzerland, assignors to Motosacoche S.A., Geneva, Switzerland

Division of Ser. No. 923,084, Jul. 7, 1978, Pat. No. 4,243,620, which is a continuation of Ser. No. 692,508, Jun. 3, 1976, abandoned. This application Jul. 10, 1980, Ser. No. 168,370
Claims priority, application Switzerland, Jun. 13, 1975, 7666/75
Int. Cl.³ B29F *1/00, 1/05*
U.S. Cl. 425—562 **2 Claims**

1. Apparatus for producing an object made of plastic material, comprising a mold comprised by a hollow die having an open end for the reception of plastic material, a punch having a free end and having an external diameter smaller than the internal diameter of the die, means for reciprocating said

punch in the die toward and away from said open end to close and respectively open said end of said die, the internal side walls of said die adjacent said end thereof tapering toward said end thereof whereby said end thereof is of a diameter smaller than the greatest internal diameter of the die, said punch adjacent said free end tapering to a smallest diameter at said free end which is substantially the same as the diameter of said end of said die, said free end of said punch being flush with the outer surface of the die when the punch closes the die, and a



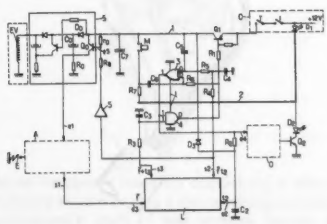
nozzle having a duct therethrough for supplying plastic material under pressure to the die, the nozzle being slidable on the die between a first position in which the duct is out of registry with the open end of the die and a second position in which the duct is in registry with the open end of the die, the die closing the duct in said first position and the free end of the punch closing the duct in said second position when the punch closes the die, the punch and die in said second position defining between them a mold cavity that surrounds the punch.

4,324,542

ELECTRONIC SAFETY DEVICE FOR A FLUID, PARTICULARLY GASEOUS, FUEL BURNER

Jacques Challet, Allegre, France, assignor to Constructions Electriques, Le Puy, France

Filed Jan. 30, 1980, Ser. No. 116,787
Claims priority, application France, Feb. 1, 1979, 79 02683
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—78 **6 Claims**



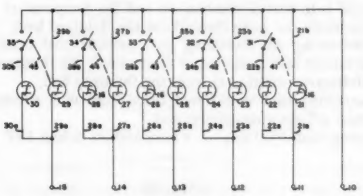
1. An electronic safety device for fluid, particularly gaseous, fuel burner, of the intermittent operating type, said device being of the type adapted to operate in successive heat demand cycles for alternately producing a flame and for providing for extinction of the flame depending respectively on the presence or absence of a heat demand, the fuel supply to the burner being controlled by an electromagnetic valve connected to an electrical power supply circuit comprising at least two controlled switches, a first one of said switches comprising a thermostatic switch subjected to the temperature to be regulated, and a further one of said switches comprising a manually controlled on/off switch, the connection to the electrical power supply being made by means of a controlled switch member, said device having several operating states at least one of which comprises a safety state in which the input of the fuel to the burner is inhibited, said safety state being removed only by manual actuation of a resetting means, wherein the improvement comprises the provision of a said controlled switch member comprising a semi-conductor switch member and of a multi-input logic circuit means, which provides bistable operation and includes an output terminal connected to the control electrode of said switch member, for producing, responsive to the manual actuation of said resetting means, a first, "normal operating" output in which the said switch member is maintained in a conductive condition and the fuel valve is open and for producing, responsive to at least one fault requiring interruption of the fuel supply at least by the time at which the subsequent heat demand cycle is initiated, a second, "fault detection" output in which said switch member is rendered non-conductive and said fuel valve is closed; and the provision of short circuit detection means, connected to one input of said multi-input logic means, for detecting short-circuiting of said controlled switch member and for causing said logic means to produce said "fault detection" output responsive to short circuiting of said controlled switch member.

4,324,543

PHOTOFLASH ARRAY WITH SELECTIVE PAIRING OF LAMPS AND SWITCHING OF COMMON CIRCUIT

David R. Broadt, Lewisburg, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 6, 1980, Ser. No. 156,991
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **8 Claims**



1. A photoflash lamp array comprising, in combination:

a plurality of 2 n flashlamps, each having first and second lead-in wires;

a plurality of n selective terminal means, each associated with a respective pair of said 2 n lamps and electrically connected to the first lead-in wire of each of the lamps of said respective pair;

a common terminal means associated with all of said 2 n lamps and directly connected in electrical circuit to the second lead-in wire of one of the lamps of each of said respective pairs of 2 n lamps; and

a plurality of n normally open switches, each coupled in electrical circuit between said common terminal and the second lead-in wire of the other of the lamps of an associated one of said respective pairs of 2 n lamps, whereby each of said normally open switches is coupled between the second lead-in wires of an associated one of said respective pairs of 2 n lamps;

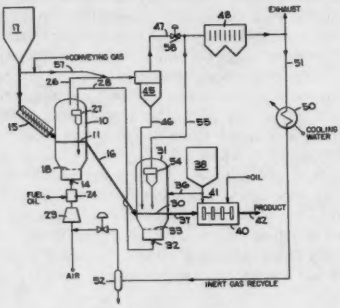
said common and selective terminal means being adapted for connection to a source of firing pulses, and each of said switches being responsive to the flashing of the directly connected lamp of an associated pair so as to electrically connect the other lamp of said associated pair to said common terminal means.

4,324,544

PROCESS AND SYSTEM FOR DRYING COAL IN A FLUIDIZED BED BY PARTIAL COMBUSTION

John H. Blake, Menlo Park, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 12, 1980, Ser. No. 158,857
Int. Cl.³ F26B 3/08; F27B 15/00
U.S. Cl. 432—14 9 Claims



1. A continuous process for drying particulate coal utilizing heat obtained only from controlled combustion of coal within a fluidized bed of particulate coal after the fluidized bed has first been initially fluidized and raised to a temperature between about 400°–600° F., comprising the steps of:

maintaining fluidization of the particulate wet coal with an unheated fluidizing gas containing oxygen to form the fluidized bed;

maintaining sufficient oxygen for combustion within the fluidized bed so that the bed temperature is controlled within the range between 400° F. and 600° F. whereby the coal is in partial combustion and the temperature is substantially the same throughout the fluidized bed;

withdrawing the fluidizing gas, gaseous coal combustion products and water vapor from above the fluidized bed;

withdrawing dried coal from the fluidized bed;

maintaining said withdrawn dried coal in a substantially inert off-gas atmosphere; and

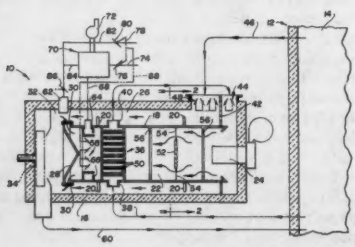
cooling said dried coal to a temperature below 140° F.

4,324,545

RECIRCULATING HEATER FOR PROCESSING OVEN

Gordon F. Hubbert, Plymouth, Mich., assignor to Gladd Industries, Inc., Detroit, Mich.

Filed Sep. 22, 1980, Ser. No. 189,483
Int. Cl.³ F24H 1/00
U.S. Cl. 432—223 12 Claims



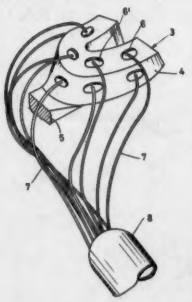
1. A recirculating heater for processing ovens comprising: an elongated outer housing; an elongated inner housing received within the outer housing in a spaced relationship thereto so as to define a first gas flow path through the inner housing and a second gas flow path between the outer and inner housings; a burner at the upstream end of the inner housing along the first path to provide heating of gas flowing therealong; a mixing member of a conical shape located at the downstream end of the inner housing and pointing upstream toward the burner so as to deflect gas flowing along the first path outwardly toward gas flowing along the second path; a mixing chamber defined by the outer housing downstream from the conical mixing member such that gas from the first and second paths is mixed therein; a blower within the mixing chamber for drawing gas through the first and second gas flow paths; an internal heat exchanger located within the inner housing between the burner and the conical mixing member so as to extract heat from the gas flowing along the first path; and a supply conduit for delivering gas carrying the heat extracted by the heat exchanger to the upstream end of one of the flow paths such that the gas temperature within the inner housing upstream from the heat exchanger can be sufficiently high to provide thermal incineration of combustible pollutants while still delivering gas of a much lower temperature from the heater.

4,324,546

METHOD FOR THE MANUFACTURE OF DENTURES AND DEVICE FOR CARRYING OUT THE METHOD

Paul Heitlinger, Chemnitzer Strasse 15, 6054 Rodgau 3, and Fritz Rodder, Schulstrasse 1, 6273 Waldems/Esch, both of Fed. Rep. of Germany

Filed Jul. 14, 1980, Ser. No. 167,974
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936847
Int. Cl.³ A61C 13/00
U.S. Cl. 433—25 16 Claims

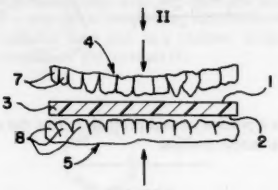


1. Apparatus for the manufacture of dentures in which the prepared tooth stump is reproduced in a working model, and a denture suitably conformed to the working model is formed, comprising means forming an optical reproducing device for sweeping over a tooth or tooth stump and providing an electrical output signal of three dimensional surface-information coordinates, a computer for receiving said output signal, and a milling machine operated and controlled by said computer for forming a three dimensional reproduction of said tooth or tooth stump in accordance with said surface-information coordinate signals.

4,324,547
DENTISTRY TECHNIQUE

Mircea Arcan, Tel-Aviv, Israel, and Benedict Heinrich, Bremen, Fed. Rep. of Germany, assignors to Vishay Intertechnology, Inc., Malvern, Pa.

Filed Jan. 4, 1979, Ser. No. 1,009
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840365; Sep. 16, 1978, 7827611[U]
Int. Cl.[3] A61C 9/00
U.S. Cl. 433—71 58 Claims

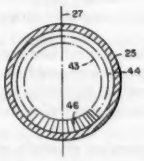


1. A method of examining and determining the characteristics of a set of teeth and especially of human teeth, comprising
placing between the teeth to be examined at least one strip-like segment of a material which is not completely elastic (i.e. elasto-plastic), optically isotropic and exhibiting mechanical birefringence (i.e. stress birefringence),
bringing the jaws which hold the teeth to be examined to bear under pressure against the strip-like segment,
removing the strip-like segment deformed by the teeth to be examined, and
studying the impressions formed within the strip-like segment under polarized light.

4,324,548
LATCH MECHANISM FOR DENTAL HANDPIECE ASSEMBLY

John D. Nilles, Roselle; Stanley L. Stankiewicz, Chicago, and David S. Zubriski, Mt. Prospect, all of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 23, 1980, Ser. No. 161,680
Int. Cl.[3] A61C 1/08
U.S. Cl. 433—126 22 Claims

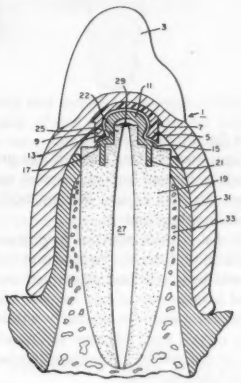


1. A dental handpiece assembly comprising a motor section and a handpiece section having a motor casing and a handpiece casing, respectively; each of said sections having a power-transmitting shaft axially disposed therein; said sections normally being disposed in longitudinal alignment with the respective power-transmitting shafts thereof in operative engagement with each other; and latching means releasably connecting said sections in operative relationship; wherein the improvement comprises
said latching means including a tubular latching ring provided by said motor section adjacent said handpiece section; said latching ring having a circumferentially-exposed annular outer surface continuing axially beyond the outer surface of said motor section; means mounting said ring for transverse movement between a latching position wherein said ring is coaxial with said motor section and has its annular outer surface substantially aligned with the outer surface of said motor section and an unlatching position wherein said ring is displaced laterally relative to said motor section; a spring urging said ring into said latching position; said handpiece casing having a tubular neck provided with an annular flange disposed within said ring when said sections are latched together; and an arcuate projection provided within said ring and engaging said neck and flange to prevent axial separation of said sections when said ring is in its latching position; said projection being shifted laterally away from said neck and flange when said ring is urged into its unlatching position for disconnection of said section.

4,324,549
ASSEMBLY FOR ATTACHING A DENTAL PROSTHESIS TO TEETH

George W. Madray, 2525 Community Rd., Brunswick, Ga. 31520

Continuation of Ser. No. 960,118, Nov. 13, 1978, abandoned.
This application Sep. 26, 1980, Ser. No. 191,019
Int. Cl.[3] A61C 13/28
U.S. Cl. 433—169 4 Claims

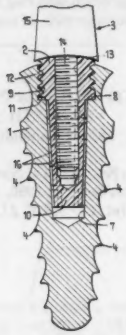


1. In combination, an assembly of elements for removably securing a denture in the mouth of a person who needs to wear a denture, comprising a tooth cap having a selected bottom contour so that the cap may be securely cemented to a prepared surface on the outer end of an anchor tooth, the prepared surface on the anchor tooth being made to accurately match the selected contour on the cap, said cap including, a stud element, having a head portion and a narrow neck portion, projecting from the tooth cap in a direction away from the anchor tooth, an elastic member having a ring portion with an internal diameter less than the head portion of the stud element but slightly greater than the neck portion of the stud element, so that the elastic member may be forced over the head portion to the neck portion and thus be held in place, the denture material above the head of the stud element being hollowed out sufficiently so that the pressure load on the dentures during use is not transferred to the head of the stud element, means for securing the outer region of the elastic member to the denture, the tooth cap also including, at its lower outer peripheral region, a ring portion in the shape of a frustum of a cone having an upper load receiving surface during use engaging the bottom of the ring portion of the elastic member to thus during use take some of the denture load on the gums onto the shoulder region of the anchor tooth, the ring portion of the cap also having a lower surface in the shape of the frustum of a cone to thus, when cemented to the matching surface on the anchor tooth, firmly circumferentially grips the anchor tooth to strengthen the anchor tooth against splitting.

4,324,550
IMPLANT FOR THE JAW

Jürgen Reuther, Frankfurt, Fed. Rep. of Germany; Heinz Moser, and Hermann Krauss, both of Selzach, Switzerland, assignors to Osteo AG, Selzach, Switzerland

Filed Nov. 21, 1980, Ser. No. 209,296
Claims priority, application Switzerland, Nov. 21, 1979, 10374/79
Int. Cl.³ A61C 8/00
U.S. Cl. 433—174 9 Claims



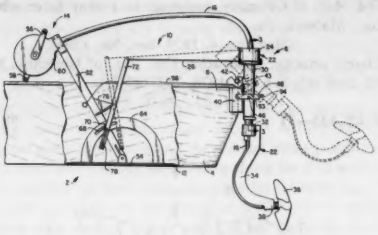
1. An implant for the jaw, comprising:
a conical implant body having support ribs provided on the external surface thereof and an internal passageway extending from the base of said implant body towards the vertex of said implant body;
a conical bed of a plastics material having an internal passageway extending from the base of said bed towards the vertex of said bed, said bed positioned coaxially within said internal passageway of said implant body; and
an implant support positioned coaxially within said internal passageway of said bed, whereby said implant support is maintained in the jaw by cementless implantation of said implant body into the jaw.

4,324,551
BOW-MOUNTED PROPELLER DRIVEN BOAT

Albert G. Gurries, 3540 Hecker Pass Rd., Gilroy, Calif. 94939

Filed Dec. 29, 1980, Ser. No. 220,404
Int. Cl.³ B63H 16/14
U.S. Cl. 440—28 4 Claims

2. A propeller driven boat for use on a body of water, said boat of the type having a bottom, sides and a seat comprising: a bow-mounted, hand-powered propeller drive, said propeller drive having a forwardly disposed propeller configured to pull said boat over said body of water and being pivotally mounted to said boat along a first axis generally parallel to said bottom, and foot-actuated steering means for changing the directional orientation of said propeller drive around a second axis generally normal to said bottom so that activating a first pedal moves said propeller drive around said second axis in one direction and activating a second pedal moves said propeller drive around said second axis in a direction opposite said one direction, and simultaneous activation of said first and second pedals moves said hand-powered propeller drive about said first axis

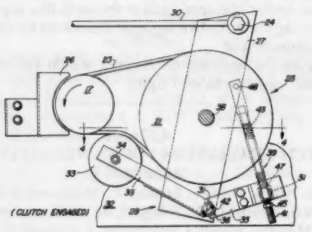


to lift at least a portion of said propeller drive out of said body of water to a raised position.

4,324,552
BELT DRIVE SYSTEM WITH CLUTCH

Sidney J. Boushek, Jr., Ottumwa, and Travis B. Unterzuber, Agency, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 14, 1980, Ser. No. 130,271
Int. Cl.³ F16H 7/00, 7/12, 7/14
U.S. Cl. 474—118 7 Claims



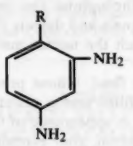
1. In a belt drive system comprising
(a) a support;
(b) a first sheave rotatably mounted relative to said support;
(c) a second sheave rotatably mounted relative to said support;
(d) a belt entrained around said sheaves for providing driving engagement between said sheaves;
(e) an idler assembly including an idler pulley and a bias member for biasing said pulley toward and away from said belt; and
(f) an actuator member pivotally mounted relative to said support and having said second sheave rotatably mounted thereon, said actuator member and said second sheave movable together toward and away from said first sheave for slackening and tensioning said belt, respectively; wherein the improvement comprises said bias member connected to said actuator member for biasing said idler pulley toward and away from said belt when said actuator member and said second sheave are moved away from and toward said first pulley, respectively.

4,324,553
HAIR DYEING COMPOSITIONS CONTAINING AT LEAST ONE 2,4-DIAMINO-ALKYLBENZENE AS COUPLER

Andrée Bugaut, Boulogne, and Alex Junino, Aulnay Sous Bois, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 7, 1980, Ser. No. 166,234
Claims priority, application France, Jul. 24, 1979, 79 19039
Int. Cl.³ A61K *7/13*
U.S. Cl. 8—407 **34 Claims**

1. A composition suitable for dyeing human hair in the presence of an oxidizing agent selected from the group consisting of hydrogen peroxide, urea peroxide and ammonium persulfate, said composition comprising an aqueous solution of at least one oxidation base and, as a coupler, at least one metaphenylenediamine of the formula (I)



(I)

wherein R represents n-propyl, isopropyl or n-butyl, or a salt thereof.

20. A composition suitable for dyeing human hair in the presence of at least one oxidizing agent selected from the group consisting of hydrogen peroxide, urea peroxide and ammonium persulfate comprising an aqueous solution of an effective amount of an oxidation base selected from the group consisting of (a) a paraphenylenediamine, (b) 2,5-diaminopyridine and (c) a para-aminophenol and 0.005 to 2.5 percent by weight based on the total weight of the composition of, as a coupling agent, at least one of a member selected from the group consisting of 2,4-diamino n-butyl benzene, 2,4-diamino n-propyl benzene, 2,4-diamino isopropyl benzene, and a salt thereof, said composition having a pH ranging from 8 to 11.5.

22. The composition of claim 20 which also contains an effective amount of a direct dye selected from the group consisting of 3-nitro-6-N-(β-hydroxyethyl) amino anisole, 3-nitro-4-aminophenol, 3-nitro-4-N-(β-hydroxyethyl) aminophenol, 2-amino-3-nitro isopropyl benzene, 3-nitro-4-N-methylamino-N,N-di-(β-hydroxyethyl) aniline, 2-nitro-4-methyl-6-amino phenol and 2-methyl-4-amino-5-nitrophenol.

4,324,554
USE OF TKP AS AN ANTIMIGRANT

Joseph S. Racciato, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 9, 1978, Ser. No. 959,119
Int. Cl.³ D06P *1/50*
U.S. Cl. 8—561 **8 Claims**

1. In an aqueous dye-bath liquor suitable for impregnating substrates, the improvement that comprises the incorporation in said dye-bath liquor, as an antimigrant, of TKP at a concentration ranging from about 0.01% to about 5.00% by weight based on the total weight of said dye-bath liquor, wherein said TKP is tamarind kernel powder or cold-water soluble tamarind kernel powder.

4,324,555
URANIUM EXPLORATION

Roger L. Borst, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

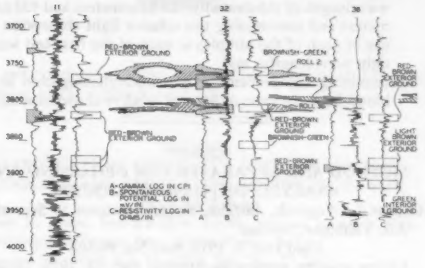
Filed Jun. 27, 1980, Ser. No. 163,661
Int. Cl.³ G01V *9/00*
U.S. Cl. 23—230 EP **4 Claims**

1. Process for prospecting for uranium roll front deposits comprising

(a) establishing a relationship between the clay content of samples from a formation, said clay content being determined for one or more clays selected from the group of montmorillonite, chlorite, kaolinite and illite, and the relative location of the underground origin of such samples with respect to a uranium roll front in said formation, where the establishing is done by determining clay content for each sample and recording whether the sample for which the clay is determined is an interior, uranium roll front, or exterior sample,

(b) drilling at least one first hole through said formation,

(c) obtaining one or more clay-bearing samples from the so drilled hole or holes,



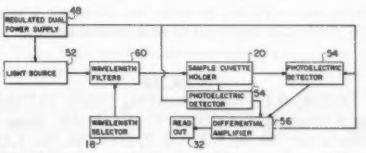
(d) analyzing said sample or samples obtained in step (c) for the content of said clay or clays for which said relationship has been established in step (a), and characterizing the samples so analyzed as to their relative positions with respect to a roll front in the formation by said relationship,

(e) drilling at least one second hole through the formation, the geographic location of which is determined from said characterizing of said samples in step (d), and analyzing one or more samples from the second hole, in order to determine the location and/or shape of a uranium bearing formation.

4,324,556
PORTABLE COHB ANALYZER

Robert F. Robertson, Gaithersburg; Thomas J. Connor, Riverdale, and F. Lee Rodkey, Kensington, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1980, Ser. No. 133,749
Int. Cl.³ G01N *33/72*
U.S. Cl. 23—230 B **18 Claims**



1. An apparatus for determining the percentage of carboxyhemoglobin in blood comprising:

a spectrophotometer operable at preselected light wavelengths for determining relative light absorption values for each of a test sample and a reference sample at each of said preselected light wavelengths;

means for selecting first and second respective wavelengths of substantially 420 nanometers and 432 nanometers of operation of said spectrophotometer;

means for testing said samples at said first and second wavelengths, the reference sample comprising a mixture of a liquid carrier and a reducing reagent, the test sample

comprising a mixture of the liquid carrier, the reducing reagent, and a sample of blood under test; and

means for determining the percentage of carboxyhemoglobin in said blood from the ratio of said relative light absorption values.

8. A method for determining the percentage of carboxyhemoglobin in blood comprising the steps of:

preparing a reference and a test samples, the first reference sample comprising a mixture of a liquid carrier and a reducing reagent, the test sample comprising a mixture of the liquid carrier, the reducing reagent, and a sample of blood under test,

testing said samples at a first and a second respective light wavelength of substantially 420 nanometers and 432 nanometers and determining the relative light absorption values of each of the samples at each of the first and second light wavelengths; and

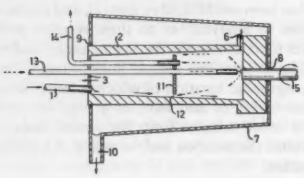
determining the percentage of carboxyhemoglobin in the blood from the ratio of derived relative absorption values.

4,324,557

METHOD AND APPARATUS FOR DEGASSING AND ANALYSIS OF FOAMING LIQUIDS

Gunnar L. Wegstedt, Järfälla, Sweden, assignor to Servochem AB, Vallingby, Sweden

Filed Dec. 3, 1979, Ser. No. 99,505
Claims priority, application Sweden, Dec. 14, 1978, 7812850
Int. Cl.³ G01N *9/30, 31/12*
U.S. Cl. 23—232 R **5 Claims**



1. A method of analysis of foaming liquids, comprising spreading a foaming liquid in a thin film by centrifugal force in a container shaped as a figure of revolution by rotating the container about its axis, blowing air into the container thereby to enrich the air in a component of the liquid to be measured, removing from the container and analyzing the thus-enriched air, said container having a slightly conical internal wall, introducing the liquid to be degassed at the small end of the conical wall, removing degassed liquid from adjacent the large end of the conical wall, removing foam from adjacent the small end of the conical wall, and introducing said air into the container and removing said enriched air from the container a substantial distance from said small end of said conical wall.

4,324,558

METHOD OF MONITORING TOXIC FLUIDS

Arthur S. Obermayer, 139 Main St., Cambridge, Mass. 02142

Division of Ser. No. 62,973, Aug. 2, 1979, Pat. No. 4,258,000.
This application Mar. 19, 1981, Ser. No. 245,339
Int. Cl.³ G01N *31/00*
U.S. Cl. 23—232 R **22 Claims**

1. A method of detecting a toxic fluid, which method comprises:

(a) providing a material for the detecting and monitoring of a toxic fluid, which material comprises a solid, microporous, transparent, polymeric, matrix material having interconnecting micropores, the micropores being of sufficiently small size or of index-matching polymeric composition to permit the material to be transparent or be made transparent, when the micropores contain a liquid composition, and which micropores permit a high solute-liquid diffusion coefficient, and which matrix material includes, within the interconnecting small micropores, a liquid composition, which liquid composition is nonreactive with the polymeric matrix material and which is retained within the interconnecting pores of the matrix material in a volume greater than 20% by volume of the polymeric matrix material, and which liquid composition comprises

(i) a nonevaporative solvent for the toxic fluid to be detected, whereby the fluid will be dissolved rapidly in the solvent, on exposure of the badge-monitoring material to the toxic fluid, and

(ii) a reactant for the toxic fluid dissolved in the solvent which reacts with the toxic fluid and which, on such reaction, results or causes a change in visual appearance of the liquid composition maintained within the micropores of the matrix material, whereby a rapid, diffusive change in the appearance of the transparent matrix material appears throughout the depth of the matrix material which signals and detects the presence of the toxic fluid to which the matrix material has been exposed;

(b) exposing the toxic fluid, whose presence is to be detected, to the liquid-filled matrix material; and

(c) observing a change in appearance of the liquid-composition-filled matrix material, after exposure of the material, over a predetermined time period, to the toxic fluid, thereby detecting the presence of a toxic fluid.

4,324,559

METHOD FOR THE REMOVAL OF SULFUR FROM CARBONACEOUS MATERIAL

Clifford R. Porter, 11457 W. 69th Pl., Arvada, Colo. 80004, and Herbert D. Kaesz, 2631 Westridge Rd., Los Angeles, Calif. 90049

Filed Sep. 22, 1980, Ser. No. 189,087
Int. Cl.³ C10L *9/02*
U.S. Cl. 44—1 SR **28 Claims**

1. A method of reducing the sulfur content of coal, comprising:

contacting the coal with a sulfur content reducing agent selected from the group consisting of metal carbonyls, other low valent metal complexes of the transition metals, derivatives thereof and mixtures thereof, and water to form a reaction mixture,

maintaining the pH of the reaction mixture greater than about 7.5, and

heating the reaction mixture to a temperature within the range of about 30° C. to below the decomposition temperature of the sulfur content reducing agent for a sufficient period of time to obtain a reduction in the sulfur content of the coal.

2. The method of claim 1 wherein the sulfur content reducing agent is a metal carbonyl selected from the group consisting of vanadium carbonyl, chromium carbonyl, manganese carbonyl, iron carbonyl, cobalt carbonyl, nickel carbonyl, molybdenum carbonyl, ruthenium carbonyl, palladium carbonyl, tungsten carbonyl, derivatives thereof, and mixtures thereof.

4. The method of claim 1 wherein the sulfur content reducing agent is a low valent metal complex selected from the group consisting of the metallocenes and derivatives thereof.

4,324,560

PYRITE REMOVAL FROM COAL

Anthony G. Fonseca, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 5, 1980, Ser. No. 127,346
Int. Cl.³ C10L *9/02*
U.S. Cl. 44—1 SR **5 Claims**

1. A method for the separation of pyrite and refuse from coal when a majority of said coal is crushed to a suitable size for air classification, comprising

(a) crushing said coal to a suitable size;

(b) passing said crushed coal through an air classifying means, said means separating crushed coal into a fine, low pyrite fraction suitable for immediate use and a coarse, pyrite-rich fraction and drying said coarse fraction to a surface water content of not more than 5% by weight.

(c) contacting the coarse pyrite rich fraction with an organic heavy media selected from the group consisting of perchloroethylene, trichloroethylene, carbon tetrachloride, pentachloropropane, tetrachloropropane, 1,1,1-trichloroethane, chloroform, methylene chloride, 1,1,2-trichloroethane, 1,1,1,2-tetrachloroethane, and 1,1,2,2-tetrachloroethane.

(d) thoroughly mixing the organic media and coal;

(e) allowing the coal to separate in the organic media forming a sink pyrite-rich refuse phase and a float coal phase;

(f) recovering the float coal phase; and

(g) separating coal from the float coal phase.

4,324,561

COMBUSTIBLE FUEL PELLETS FORMED FROM BOTANICAL MATERIAL

John J. Dean, and Lloyd M. Helzig, both of Springfield, Oreg., assignors to NIPAC, Ltd., Eugene, Oreg.

Continuation of Ser. No. 1,962, Jan. 8, 1979, abandoned, which is a division of Ser. No. 770,990, Feb. 22, 1977, Pat. No. 4,211,740, which is a continuation-in-part of Ser. No. 590,511, Jun. 26, 1975, abandoned. This application Jul. 24, 1980, Ser. No. 171,730

Int. Cl.³ C10L *5/08*

U.S. Cl. 44—10 E **5 Claims**

5. Combustible fuel pellets formed from botanical fuel material produced by reducing the moisture content of the material to an average of approximately 12 percent, grinding the dried material to a size sufficiently small to pass through a screen having openings no greater than 0.95 cm., heating the ground material to within an average range of 90° C. to 121° C., forcing the dried, ground and heated material under substantial pressure and friction through extrusion passages having a cross-section not exceeding approximately 0.635 cm. and while being forced through the passages compacting the material to substantially increase the density of the formed pellets and simultaneously reducing the moisture content to approximately 10 percent and increasing the temperature of the pellets thereby causing the natural bonding agents in the material to plasticize throughout substantially the length and diameter of the formed pellets so as to produce a bonded pellet product having a smooth and plasticized surface coating and the formed pellets having the required properties and characteristics to provide an extended storage and shipping life in an atmospheric environment.

4,324,562

METHOD OF IMPROVING THE STORAGE SAFETY OF PULVERIZED BROWN COAL

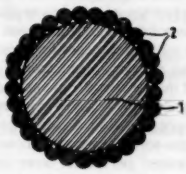
Fritz Schoppe, Max-Rüttgers-Strasse 24, 8026 Ebenhausen, Fed. Rep. of Germany

Continuation of Ser. No. 865,483, Dec. 29, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 76,084

Int. Cl.³ C10L *9/00*

U.S. Cl. 44—1 G **1 Claim**

1. Method of improving the storage safety of pulverized brown coal by covering brown coal particles with smaller particles of finely pulverized anthracite, wherein about 2% or less of the anthracite particles have a size over 0.010 mm and about 23% or less of the anthracite particles have a size over 0.005 mm, and wherein the brown coal particles are about ten times the size of the anthracite particles, about 14% or less of the brown coal particles having a size over 0.2 mm and about 40% or less of the brown coal particles having a size over 0.063 mm, comprising mixing such brown coal particles with at least about 20% by weight of such anthracite particles before storage and continuing mixing until the particle mixture shows a uniform, black, anthracite-like color.



4,324,563

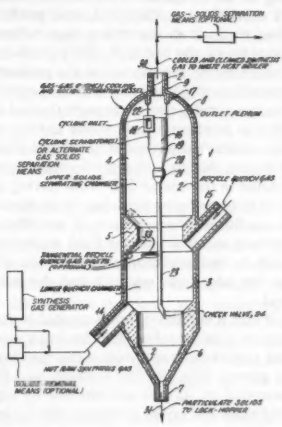
GASIFICATION APPARATUS WITH MEANS FOR COOLING AND SEPARATING SOLIDS FROM THE PRODUCT GAS

Henry B. Jones, and Randlow Smith, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 13, 1979, Ser. No. 57,228

Int. Cl.³ C10J *3/84*

U.S. Cl. 48—62 R **10 Claims**


GAS—SOLIDS SEPARATION MEANS (OPTIONAL)
COOLED AND CLEANED SYNTHESIS GAS TO WASTE HEAT BOILER
OUTLET PLENUM
CYCLONE BAFFLE
CYCLONE SEPARATORS OR ALTERNATE GAS-SOLIDS SEPARATION MEANS
UPPER SOLIDS SEPARATING CHAMBER
RECYCLE QUENCH GAS
TANGENTIAL RECYCLE QUENCH GAS INLETS (OPTIONAL)
LOWER QUENCH CHAMBER
SYNTHESIS GAS GENERATOR
CHECK VALVE, ETC.
HOT RAW SYNTHESIS GAS
SOLIDS REMOVAL MEANS (OPTIONAL)
PARTICULATE SOLIDS TO LOCK-HOPPER

1. An apparatus for producing a hot gas stream comprising H_2, CO, CO_2, H_2O, and containing entrained solid matter and slag by the partial oxidation of solid carbonaceous fuel and cooling and cleaning said hot raw gas stream and separating therefrom entrained solid matter and slag comprising:

(1) a partial oxidation gas generator for producing said hot gas stream;

(2) a separate closed vertical cylindrical pressure vessel internally lined with high temperature resistant refractory with a coaxial lower gas-gas quench cooling and solids separation chamber in communication with a coaxial upper chamber; a coaxial choke-ring passage of reduced diameter connecting said lower and upper chambers;

(3) a first gas inlet nozzle in said lower chamber, said first nozzle connected to said gas generator for introducing said hot raw gas stream into said lower chamber; a second gas inlet nozzle in said lower chamber, said second nozzle connected to a source of recycle quench gas comprising at least a portion of the cooled and cleaned gas stream from (4) directly opposite and coaxial with said first gas inlet nozzle for simultaneously introducing into said lower

chamber a cooled and cleaned recycle quench gas stream; wherein said gas streams impinge, said hot raw gas stream is cooled by direct heat exchange with said cooled and cleaned gas stream, and solid matter separates by gravity and falls to the bottom of said lower chamber;

(4) at least one gas-solids separation means supported in said upper chamber with inlet means for receiving the mixture of gases passing up the vessel from (3) and removing additional solid matter therefrom and means for discharging said solid matter into said lower chamber; upper outlet means in the upper portion of said upper chamber connected to said gas-solids separation means for discharging a cooled and cleaned gas stream from said apparatus; and

(5) an outlet means in the bottom of said lower chamber for discharging solid matter.

4,324,564

ADSORPTION BEDS AND METHOD OF OPERATION THEREOF

Michael D. Oliker, Boston, Mass., assignor to Near Equilibrium Research Associates, Boston, Mass.

Filed Jul. 7, 1980, Ser. No. 166,054
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—20 **24 Claims**

1. A method of operating an adsorption bed having an adsorbent material disposed within a housing defining a feed entrance, a fluid flow path, and a product exit, said adsorbent material being of the type used to reduce the concentration of an adsorbate carried by a fluid feed, said method including cycling the bed through an adsorption stage wherein the fluid feed is passed through the bed and a fluid product of reduced adsorbent concentration is collected at the product exit, and a thermal regeneration stage wherein a hot regenerant fluid and a cooling fluid are serially passed through the bed co-currently to one another to produce a fluid waste having an adsorbate concentration substantially greater than said fluid feed at a waste exit wherein, during said regeneration stage,

there is created in the bed an RW front having a first velocity, said RW front being bounded on its downstream side by bed conditions characteristic of equilibrium between the adsorbent material and the fluid waste and on its upstream side by bed conditions characteristic of equilibrium between the adsorbent material and the hot regenerant fluid, and

upstream of said RW front, there is created in the bed by the introduction of said cooling fluid having a lower temperature than said regenerant fluid, a thermal front having a velocity greater than said first velocity, said thermal front being bounded on its downstream side by high temperature conditions and on its upstream side by low temperature conditions,

wherein the improvement comprises:

introducing said cooling fluid into the bed before the midpoint of the RW front exits the bed to produce, during a portion of the cooling fluid flow, fluid waste at said waste exit having an adsorbate concentration substantially greater than the adsorbate concentration of said feed.

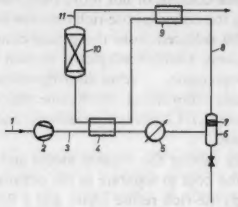
4,324,565

REMOVAL OF LUBRICANT MISTS AND LUBRICANT VAPORS FROM A GASEOUS STREAM

Christian Benkmann, Graefelfing, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 180,286
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935147
Int. Cl.³ B01D *49/00, 53/04*
U.S. Cl. 55—23 **17 Claims**

1. In a process for the removal of oil mists and vapors from an oil-contaminated compressed gas comprising passing the compressed gas through an oil separator wherein liquid phase oil is removed from the gas and passing the resultant gas through an adsorber to remove gaseous phase oil, the improvement which comprises, after passing the compressed gas through the oil separator, heating the withdrawn compressed



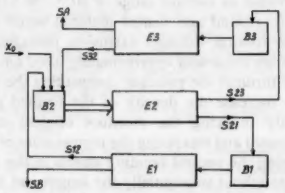
gas to such an extent that any oil mist remaining therein is completely vaporized before the withdrawn compressed gas is conducted through the adsorber.

4,324,566

PROCESS FOR THE SEPARATION OR PURIFICATION OF MIXTURES BY THE USE OF A SOLID ADSORPTION

Philippe Jacob, Champagne en Valmorey, and Daniel Tondeur, Neuves-Maisons, both of France, assignors to ELF France, Paris, France

Filed Jul. 2, 1980, Ser. No. 165,243
Claims priority, application France, Jul. 6, 1979, 79 17624
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—28 **17 Claims**



1. A process for the continuous separation of the constituents of a gaseous feed mixture which comprises introducing the gaseous feed mixture into an enclosure containing a selective adsorbent, and subjecting the mixture to a cyclical series of hot and cold stages by sudden variations in the feed temperature between a hot temperature T_c and a cold temperature T_F to create in the cold feed stage three successive distinct zones which move in the flow-direction at different speeds;

(A) a first low speed zone of propagation comprising a sorption front in which the concentration of the most adsorbable constituents in the gas decreases;

(B) a second zone called the "thermal wave" caused at times determined by the sudden cooling of the feed mixture to the cold temperature T_F, in which the only constituents left are the least adsorbable ones, this wave propagating at a speed higher than that of the first zone and proportional to the ratio:specific heat of the non-adsorbable or least adsorbable gases/specific heat of the adsorbent;

(C) a desorption zone the speed of whose propagation is higher than that of the preceding first and second zones, where the mixture is enriched in the most adsorbable constituents; the different effluent fractions or cuts being collected separately or recycled in the feed mixture.

4,324,567

SEPARATION OF GASEOUS COMPONENTS FROM A GASEOUS MIXTURE BY PHYSICAL SCRUBBING

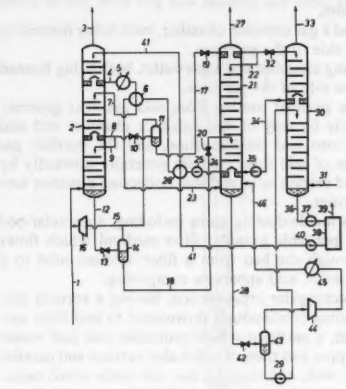
Gerhard Ranke, Poecking, and Horst Weiss, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,119

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856078

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—43 11 Claims



1. In a process for separating and obtaining as product gases at least two gaseous components from a gaseous mixture containing same comprising the following steps:

(a) scrubbing said gaseous mixture with a physical scrubbing liquid exhibiting a higher dissolving power for at least one of the components to be separated than for at least one other of these components;

(b) withdrawing a first scrubbing liquid stream, loaded with all of the components to be separated;

(c) withdrawing a second scrubbing liquid stream, merely containing substantially only proportions of the less soluble component or components;

(d) expanding said first scrubbing liquid stream of step (b) to liberate a gaseous fraction and reduced pressure first scrubbing liquid stream;

(e) expanding said second scrubbing liquid stream of step (c) to obtain reduced pressure second scrubbing liquid stream and a gaseous stream containing less soluble component or components;

(f) scrubbing the gaseous fraction of step (d) with the reduced pressure second scrubbing liquid stream of step (e) to remove from said gaseous fraction the more soluble component or components and withdrawing resultant gaseous fraction as a first product stream; and

(g) subjecting combined reduced pressure scrubbing liquid streams to a separation of a gas comprising the more soluble components as well as of residual proportions of the less soluble components and withdrawing said gas as a second product gas,

the improvement which comprises:

(h) prior to the separation of step (g), further expanding the combined reduced pressure scrubbing liquid streams to obtain a gaseous fraction and a liquid fraction, and separating said gaseous fraction from said liquid fraction;

(i) recompressing the liberated gaseous fraction of step (h);

(j) scrubbing the recompressed gaseous fraction of step (i) with the reduced pressure second scrubbing liquid stream of step (e); and

wherein the raw gas contains carbon dioxide as the less soluble component and hydrogen sulfide and/or carbonyl sulfide as the more soluble components.

4,324,568

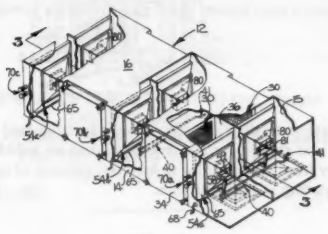
METHOD AND APPARATUS FOR THE LEAK TESTING OF FILTERS

David E. Wilcox, Carpinteria, and Thomas T. Allan, San Francisco, both of Calif., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Aug. 11, 1980, Ser. No. 177,234

Int. Cl.³ B01D *46/12*; G01M *3/20*

U.S. Cl. 55—97 12 Claims



1. A method for testing for leakage of particles of predetermined size through a bank of filters installed in a parallel arrangement in a housing and which is characterized by the ability to individually test the filters in the bank under balanced flow conditions and so as to permit the immediate identification of a leaking filter in the bank, and comprising the steps of

passing an airstream concurrently through all of the filters in the bank, while dividing the airstream into isolated portions immediately upstream of each filter such that each isolated portion of the airstream passes through a single filter,

partially restricting and imparting turbulence to the flow concurrently through all of the isolated portions and at a point upstream of each filter, and so as to obtain turbulence throughout substantially the full cross sectional area of each isolated portion and a substantially balanced flow among the isolated portions, and including pivoting a restriction member mounted within each of said separate channels from a non-operative position disposed in general alignment with the sides of the channel to an operative position disposed transversely across the channel, then

sequentially introducing particles of predetermined size within each isolated portion of the airstream and upstream of the point at which the flow is partially restricted and made turbulent, to thereby result in the particles being mixed in the air, and while maintaining a substantially unrestricted flow between the point of particle introduction and the point at which the flow is partially restricted and made turbulent, and

monitoring the airstream downstream of the bank of filters to detect at least a portion of any particles in the airstream, such that a determination may be made as to which if any of the filters in the bank is leaking.

4,324,569

AIRCRAFT FUEL BOOSTER PUMP ASSEMBLY WITH ALTITUDE START CAPABILITIES

Anthony J. Klimczak, Parma, Ohio, assignor to Lear Siegler, Inc., Elyria, Ohio

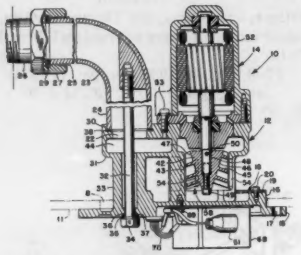
Filed Mar. 22, 1977, Ser. No. 780,229

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—182 11 Claims

1. A centrifugal aircraft fuel booster pump with altitude start capabilities comprising a housing containing an inlet and an

outlet for the fuel to be pumped, a pump impeller rotatably mounted in said housing for pressurizing the fuel received from said inlet and delivering such pressurized fuel to said outlet, said housing including a shroud surrounding said impeller, and



vent means extending radially outwardly from said impeller through said shroud for venting vapor and air bubbles in the fuel away from said impeller to facilitate priming of said pump during starting at high altitudes.

4,324,570

APPARATUS FOR DE-DUSTING GASES

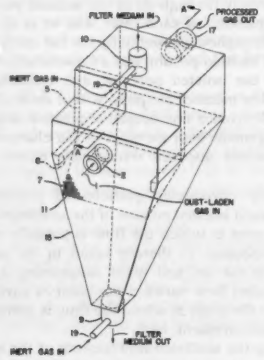
Gerhard Pforr, Ludwigshafen; Gerhard Peschau, Frankenthal; Guenter Schippmann, Mannheim; Max Appl, Dannstadt-Schauernheim; Erfried Voelkl, Frankenthal, and Hans Stark, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,444

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918779

Int. Cl.³ B01D *46/30*

U.S. Cl. 55—267 **4 Claims**



1. Apparatus for de-dusting hot and corrosive gases including a granular-bed filter having a pourable granular filter medium which flows downward through the bed from a filter medium inlet to a filter medium outlet, said apparatus comprising:

a vessel of rectangular cross-section, having a vertical side wall extending continuously downward to said filter medium outlet, a partition which protrudes into said vessel from the upper end thereof and is also vertical and parallel to said said wall, and three further side walls which taper, at least starting from the level of the lower end of said partition, downward to said filter medium outlet of said vessel,

said four side walls on their inside comprising respective plane panels of corrosion resistant material,

said filter medium inlet being located in a vertical plane on one side of said partition and generally centrally of the upper part of said vessel,

said filter medium outlet being located in a vertical plane on the other side of said partition,

said filter medium extending in said vessel along a generally S-shaped path between said filter medium inlet and said filter medium outlet, producing on said other side a first talus at the lower edge of said partition and producing on said one side a second talus at the lower edge of said filter medium inlet,

a gas inlet and a gas entrance chamber, both being formed on said other side of the partition,

a gas collecting chamber and a gas outlet, both being formed on said one side of the partition,

the gas to be purified passing from said gas inlet generaly downwardly by way of said entrance chamber and said first talus into said fluid medium, and the purified gas passing out of said fluid medium generally upwardly by way of said second talus and said collecting chamber into said gas outlet.

4. Apparatus for de-dusting gases including, a granular-bed filter having a pourable granular filter medium which flows downward through the bed from a filter medium inlet to a filter medium outlet, said apparatus comprising:

a vessle of rectangular cross-section, having a vertical side wall extending continuously downward to said filter medium outlet, a partition which protrudes into said vessel from the upper end thereof and is also vertical and parallel to said side wall, and three further side walls which taper, at least starting from the level of the lower end of said partition, downward to said filter medium outlet of said vessel,

said filter medium inlet being located in a vertical plane on one side of said partition and generally centrally of the upper part of said vessel,

said filter medium outlet being located in a vertical plane on the other side of said partition,

said filter medium extending in said vessel along a generally S-shaped path between said filter medium inlet and said filter medium outlet, producing on said other side a first talus at the lower edge of said partition and producing on said one side a second talus at the lower edge of said filter medium inlet,

a gas inlet and a gas entrance chamber, both being formed on said other side of the partition,

a gas collecting chamber and a gas outlet, both being formed on said one side of the partition,

the gas to be purified passing from said gas inlet generally downwardly by way of said entrance chamber and said first talus into said fluid medium, and the purified gas passing out of said fluid medium generally upwardly by way of said second talus and collecting chamber into said gas outlet.

4,324,571

BAG-TYPE FILTER APPARATUS WITH AIR DIFFUSER HAVING EXTENDED BAG SUPPORT

Allen S. Johnson, Jr., Post Office Drawer 1037, Salisbury, N.C. 28144

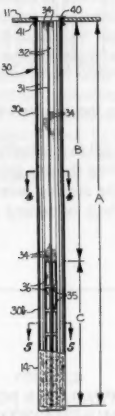
Continuation-in-part of Ser. No. 76,942, Sep. 26, 1979, Pat. No. 4,259,095. This application Mar. 25, 1981, Ser. No. 247,254

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—302 **26 Claims**

1. In a filter apparatus of the type wherein a particulate-laden gas is directed through a tubular filter bag for filtering and retaining the particulate material on the exterior of the filter bag, and wherein the filter bag is cleaned by a periodic reverse purge flow of air directed into one end of the filter bag, the combination therewith of means positioned within said filter bag and serving for supporting and holding the filter bag

in an open tubular configuration and for also diffusing and distributing air throughout the filter bag when a periodic reverse purge flow of air is directed into the filter bag so as to thereby more effectively clean the filter bag while also reducing excessive flexing of the filter bag and abrasive wear thereof, said means comprising an elongate tube means extending longitudinally within said filter bag and including substantially axially aligned first and second elongate tube sections, each tube section having a series of spaced peripheral portions extending generally outwardly beyond other portions of the respective tube section and serving for engaging the adjacent portion of the filter bag and holding the same in a generally



open tubular configuration substantially out of contact with said other portions of each tube section, said other portions of the first tube section having perforations therein located for diffusing and distributing air along the filter bag when a periodic reverse purge flow of air is directed into said first tube section at its end remote from said second tube section, and said other portions of said second tube section being open to the flow of air therethrough between adjacent peripheral portions thereof so that the second tube section serves only to hold the adjacent surrounding portion of the filter bag in generally open tubular configuration without effecting any significant diffusion or distribution of the air during the periodic reverse purge.

4,324,572

SOOT FILTER FOR AN EXHAUST ARRANGEMENT OF AN INTERNAL COMBUSTION ENGINE

Hans Erdmannsdörfer, Ludwigsburg; Horst Bergmann, Esslingen, and Helmut Daudel, Schorndorf, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

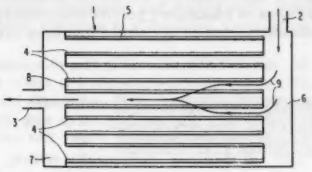
Filed Feb. 25, 1981, Ser. No. 237,899

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007642

Int. Cl.³ B01D *46/02;* **F01N** *3/02*

U.S. Cl. 55—385 R **19 Claims**

1. A filter arrangement for an exhaust gas flow of an internal combustion engine, the filter arrangement including a housing provided with feed means for enabling a feeding of the exhaust gas flow into the housing, discharge means for enabling a discharge of the exhaust gas flow from the housing, and filter material disposed between said feed and discharge means and arranged in the housing such that the entire exhaust gas flow flows through said filter material to reach said discharge means, characterized in that a support means is provided for supporting the filter material in the housing so as to be exposed to the exhaust gas flow, and in that the filter material includes



a thread spun of silicon dioxide fibers wound onto the support means.

4,324,573

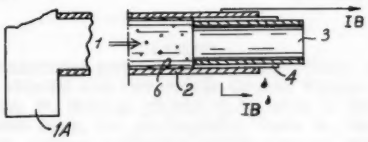
APPARATUS FOR REMOVING OIL FROM COMPRESSED AIR

Gunnar V. Eriksson, Högbyn, S-890 31, Arnäsvall, Sweden

Filed Oct. 24, 1979, Ser. No. 88,073

Int. Cl.³ B01D *45/00*

U.S. Cl. 55—396 **8 Claims**



1. An oil separator connected to a machine operating with pulsating compressed air for separating an oil mist which is otherwise expelled together with the air and is let out in the ambient atmosphere when the compressed air is drained from the machine, the oil separator consists essentially of a tube or hose open at each end and connected at one end to the air outlet of the machine operating with compressed air, a tubular scraper sleeve (3) coaxially mounted in said tube through the other end and spaced radially therefrom, said tubular scraper sleeve extending substantially inside said tube or hose and some distance outside said tube or hose thereby forming an annular space between the overlapping portions of said sleeve and said tube or hose thereby providing free flow areas in said tube or hose, said sleeve and the annular space between the tube or hose and the sleeve, said annular space being provided with a plurality of channels surrounding said scraper sleeve and opened at each end so as to permit free flow therethrough, said channels extending substantially co-axially with the flow direction of the air between the overlapping portions of scraper sleeve and the tube or hose, in which channels condensed oil is collected and moved out of the channels with a little portion of the air stream, whereas the main portion of the air flow is let out through the scraper sleeve.

4,324,574

FELT-LIKE LAYERED COMPOSITE OF PTFE AND GLASS PAPER

Joseph P. Fagan, Huntington, Conn., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1980, Ser. No. 218,214

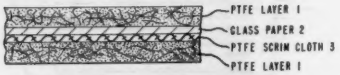
Int. Cl.³ B01D *46/00*

U.S. Cl. 55—487 **10 Claims**

1. A felt-like layered composite comprising the following:

a. a first layer of predominantly horizontal coplanar superimposed layers of filamentary polytetrafluoroethylene components interrupted by occasional interlayered orientation;

b. a thin high density nonwoven layer comprising fine glass staple fibers;
c. a scrim fabric of polytetrafluoroethylene fibers and
d. a second predominantly horizontal coplanar superimposed layers of filamentary polytetrafluoroethylene components interrupted by occasional interlayer orientation;



wherein the layers are mechanically bonded together by filamentary polytetrafluoroethylene components extending vertically throughout the composite and the composite has a filter efficiency of greater than 98%.

4,324,575

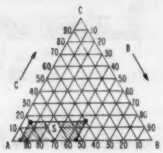
LOW TG SOFT UV-CURABLE COATINGS

Nicha Levy, Atlanta, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 177,096, Aug. 11, 1980, abandoned. This application Dec. 24, 1980, Ser. No. 219,839

Int. Cl.³ G02B *1/10, 5/14, 5/172;* C03C *25/02*

U.S. Cl. 65—3.11 **7 Claims**



1. A method for producing a fiber lightwaveguide comprising the steps of:
drawing the fiber lightwaveguide
passing the drawn fiber lightwaveguide through a prepolymer mixture to wet the fiber lightwaveguide with the prepolymer mixture,
passing the wetted fiber through a die to form a coating of prepolymer mixture on the fiber lightwaveguide,
curing the prepolymer coating by exposing the prepolymer coated fiber lightwaveguide to radiant energy
the invention characterized in that the prepolymer mixture contains a mixture of at least two oligomers having more than 10 carbon atoms and the specific rates of polymerization of the oligomers have values that match to within 15% of the smallest value.

4,324,576

METHOD FOR PRODUCING OPTICAL GLASS

Iwao Matsuyama, Sagamihara; Kenzo Susa, Hinodemachi; Shin Satoh, Iruma, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

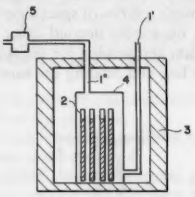
Filed Nov. 21, 1980, Ser. No. 209,711

Claims priority, application Japan, Dec. 21, 1979, 54-150082; Dec. 27, 1979, 54-169335; Jul. 15, 1980, 55-95755; Jul. 15, 1980, 55-95758

Int. Cl.³ C03C *3/04, 3/06*

U.S. Cl. 65—26 **20 Claims**

1. A method for producing optical glass, which comprises the steps of,
(i) charging a mixed solution capable of forming a high-silica-content gel by hydrolysis reaction into a vessel having a predetermined shape which is similar to the shape of the desired glass block to be produced, at least the inner surface of said vessel being provided with a material which is unwettable to the mixed solution said mixed solution containing a silicon alkoxide, water and a polar organic solvent, said silicon alkoxide being represented by the general formula $Si(OR)_4$ in which R is an alkyl group;
(ii) causing gelation of the mixed solution in said vessel;



(iii) gradually drying the gel thus obtained to form a dry gel, and
(iv) heating the dry gel to gradually elevate the temperature thereof and sintering the dry gel at a collapsing temperature lower than the melting point of the dry gel, thereby forming a glass block of desired shape.

4,324,577

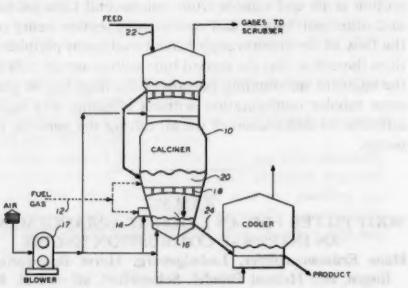
METHOD AND APPARATUS FOR BENEFICIATING PHOSPHATE ORES

Hossein K. Sepehri-Nik, Luling, La., assignor to Beker Industries, Inc., Greenwich, Conn.

Filed Feb. 25, 1980, Ser. No. 123,965

Int. Cl.³ C05B *13/02*

U.S. Cl. 71—33 **4 Claims**



1. A method for increasing the bone phosphate of lime (BPL) content of a phosphate feed stock material to be used for the manufacture of phosphate fertilizers or phosphate animal feed products and which contains fractions respectively of relatively low BPL content and relatively high BPL content which fractions are not differentiated magnetically, comprising, heating said feed stock material to a temperature within the range from about 1000° F. to about 1600° F. for a time sufficient to increase the magnetic attraction of one of said fractions relative to the other of said fractions, and separating said fraction of increased magnetic attraction from the other of said fractions by means of a magnetic field to form two separate fractions one of which has increased BPL and the other of which has decreased BPL.

4,324,578

METHOD OF PREPARING A COPPER COMPLEX FOR USE AS AN ALGAECIDE

Donald E. Seymour, River Hills; Greg A. Seymour, Brown Deer, both of Wis., and Mark J. Jaber, Goldsboro, N.C., assignors to Applied Biochemists, Inc., Mequon, Wis.

Continuation-in-part of Ser. No. 833,458, Sep. 15, 1977, abandoned, which is a continuation of Ser. No. 100,335, Jun. 8, 1976, abandoned. This application Feb. 25, 1980, Ser. No. 124,098

Int. Cl.³ A01N *31/02, 55/02, 59/20*

U.S. Cl. 71—67 9 Claims

1. An algaecide comprising an aqueous solution containing an algaecidal effective amount of a water soluble copper complex produced by mixing finely divided water insoluble copper carbonate with the combination of monoethanolamine and triethanolamine, said monoethanolamine being present in a molar ratio slightly in excess of 2:1 with respect to the copper concentration and the triethanolamine being present in a molar ratio slightly in excess of 1:1 with respect to the copper concentration, said combination acting to completely solubilize and chelate the copper carbonate to form the complex, said aqueous solution being free of acids.

4,324,579

HERBICIDAL AND PHYTOHORMONAL AMIDOXIMES

Daniel Farge, Thiais; Jean Leboul, Gif sur Yvette; Yves Le Goff, Bretigny/Orge, and Gilbert Poiget, Thiais, all of France, assignors to Philargo, Lyons, France

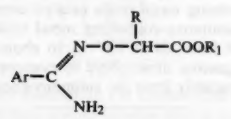
Division of Ser. No. 906,863, May 17, 1978, Pat. No. 4,216,006, which is a division of Ser. No. 722,215, Sep. 10, 1976, Pat. No. 4,116,974. This application Jan. 29, 1980, Ser. No. 116,452

Claims priority, application France, Sep. 11, 1975, 75 27884; Jul. 8, 1976, 76 21717

Int. Cl.³ A01N *43/36;* C07D *207/34*

U.S. Cl. 71—74 7 Claims

1. A new amidoxime of the formula



in which

R represents a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, or a phenyl group,

R_1 represents a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, or a metal atom, and

Ar represents a 5 membered aromatic heterocyclic group which contains an atom of nitrogen as the hetero-atom and is optionally substituted by a halogen atom, an alkyl group an alkoxy group, an alkythio group or a phenylalkyl group, wherein the alkyl moiety of each of said groups contains 1 to 4 carbon atoms.

4. A phytohormonal and herbicidal composition for plants containing, as the active material, at least one compound according to claim 1 in phytohormonal or herbicidally effective amount, in association with a carrier and/or a surface-active agent compatible with the said compound and suitable for agricultural use.

4,324,580

HERBICIDAL AND PLANT GROWTH INHIBITING AGENT

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

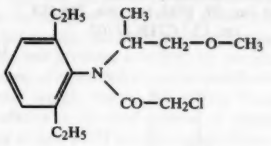
Continuation-in-part of Ser. No. 678,774, Apr. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 512,285, Oct. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,955, Jun. 4, 1973, abandoned. This application Sep. 20, 1977, Ser. No. 835,071

Claims priority, application Switzerland, Jun. 6, 1972, 8345/72; Mar. 30, 1973, 4607/73

Int. Cl.³ A01N *37/22;* C07C *103/32*

U.S. Cl. 71—118 3 Claims

1. 2,6-diethyl-N-(1'-methoxyprop-2'yl)-chloroacetanilide of the formula



(I)

4,324,581

HERBICIDAL COMPOSITION FOR CONTROL OF SEDGES AND PERENNIAL GRASSY WEEDS

Theodore W. Holmsen, Clayton, Calif.; Keith C. Barrons, Holmes Beach, Fla., and Leonard L. Smith, Jr., Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 751,631, Dec. 17, 1976, Pat. No. 4,086,081. This application Apr. 25, 1978, Ser. No. 900,035

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.³ A01N *29/10*

U.S. Cl. 71—126 12 Claims

1. A herbicidal composition which consists essentially of, by weight and in admixed form:

an effective amount, for the preemergent control of sedges and perennial grassy weeds by soil incorporation primarily above the underground stems and tubers of said sedges and grassy weeds, in the range of from about 0.005 to about 90 percent, of a meta-halostyrene selected from the group consisting of alpha-(2,2,2-trichloroethyl)-m-chlorostyrene, alpha-(2,2,2-trichloroethyl)-m-bromostyrene and a co-mixture thereof, and;

the balance a herbicide carrier selected from

(a) a surface active dispersing means;

(b) a surface active dispersing means admixed with a liquid carrier selected from the group consisting of water, and a non-aqueous liquid, the non-aqueous liquid being selected from the group consisting of petroleum distillate, agricultural spray oil, kerosene, fuel oil, naphtha, xylene, chlorinated hydrocarbon, acetone, and ether of ethylene glycol;

(c) a surface active dispersing means admixed with a finely divided solid agricultural carrier;

(d) a finely divided solid agricultural carrier in the form of a dust; and

(e) a finely divided solid agricultural carrier in granulated form,

provided that the surface active dispersing means is provided in sufficient amount to emulsify or suspend the meta-halostyrene in any water present in the composition or a tank mix prepared therefrom.

and provided further that in an admixture containing finely divided solid agricultural carrier the proportion of meta-halostyrene does not exceed about 20 percent by weight.

4,324,582

PROCESS FOR THE RECOVERY OF COPPER FROM ITS ORES

Paul R. Kruesi, 13950 Crabapple Rd., Golden, Colo. 80401, and Veryl H. Frahm, Jr., 380 S. 36th St., Boulder, Colo. 80303

Filed Jun. 11, 1980, Ser. No. 158,448
Int. Cl.³ C22B *1/02, 1/06, 1/08*
U.S. Cl. 75—1 R 14 Claims

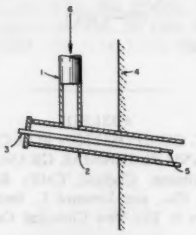
1. A process for the recovery of copper from its sulfide and oxidic ores which comprises subjecting the ores to microwave energy under conditions to convert the sulfidic and oxidic compounds in the ores to compounds from which copper is more readily recoverable.

4,324,583

SUPERSONIC INJECTION OF OXYGEN IN CUPOLAS

Jarrette A. Hamilton, Sauk Village, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 21, 1981, Ser. No. 226,553
Int. Cl.³ C21B *11/02*
U.S. Cl. 75—43 11 Claims



1. In a process for producing molten metal in a cupola furnace comprising:
(a) charging coke and metal to the cupola furnace,
(b) causing said coke to burn by the introduction of a first oxygen-containing gas,
(c) additionally injecting directly into said cupola furnace a second oxygen-containing gas having an oxygen concentration greater than said first oxygen-containing gas, said second oxygen-containing gas being injected at a flow rate equivalent to that required to enrich the oxygen concentration of said first oxygen-containing gas by from 0.5 to 10 percent, the improvement comprising:
injecting said second oxygen-containing gas directly into said cupola furnace at a supersonic velocity.

4,324,584

PROCESS FOR THE DECARBURIZATION OF CHROMIUM-CONTAINING PIG IRON

Georges Marizy, Ugine, France, assignor to Ugine Aciers, Paris, France

Filed Dec. 31, 1980, Ser. No. 221,903
Claims priority, application France, Jan. 24, 1980, 80 01809
Int. Cl.³ C21C *7/00*
U.S. Cl. 75—60 5 Claims

1. A process for the decarburization of a molten bath of chromium-containing pig iron initially containing by weight from about 1.5% to about 7% of C, from about 10% to about 30% of Cr, from about 0% to about 30% of Ni, from about 0% to about 20% of Co+Mn+Mo, and less than about 4% of Si, trace impurities, and balance Fe, said process comprising the steps of: (1) contacting the surface of the molten pig iron bath with an oxygen stream at supersonic speed from an oxygen jet whereby the force of the jet impact on the surface of the bath by turbulence effected by the oxygen stream, expells a slag coating covering the surface of the molten pig iron, (2) oxidizing in a first reaction phase the most oxidizable elements contained within the pig iron and more specifically Cr, Si, and Fe, while simultaneously increasing with a corresponding rise in temperature, the reduction of the metallic oxides of Cr, Si, and Fe thus formed by the reaction of said oxides with carbon; (3) in a second reaction phase, continuing the supersonic oxygen jet thereby maintaining the turbulence at the surface of the molten pig iron resulting in a further temperature rise and increased reduction rate of metallic oxides by carbon which reduction predominates the reaction; and (4) wherein a final reaction phase of decarburization commences when the carbon content in the pig iron attains the relationship C_D/n, wherein C_D is the initial carbon content in weight percent and n is a number from about 1.5 to about 2.5, and said final reaction phase of decarburization is further characterized by the formation of a gas and pig iron emulsion resulting from the direct action of the oxygen on the molten pig iron, which emulsion is formed essentially free of a slag coating thereon and said gas comprising a mixture of oxides of carbon and oxygen.

4,324,585

PROCESS FOR MANUFACTURE OF ALUMINUM

Henry B. Hass, 95 Fernwood Rd., Summit, N.J. 07901

Filed Jun. 2, 1980, Ser. No. 155,687
Int. Cl.³ C22B *21/02*
U.S. Cl. 75—68 B 2 Claims

1. A process for obtaining aluminum metal comprising the steps of (1) reacting an aluminum containing ore selected from the group consisting of bauxite, alumina, and clay with a carbon containing material, gaseous oxygen, and bromine in a blast furnace at elevated temperatures to obtain aluminum tribromide, (2) thermally decomposing aluminum tribromide to aluminum monobromide and bromine in a blast furnace, (3) separating the aluminum monobromide and thereafter (4) disproportionating the aluminum monobromide to form aluminum and aluminum tribromide.

4,324,586

SEPARATION OF TELLURIUM FROM TELLURIUM-ANTIMONY-CONTAINING METAL OXIDE CATALYSTS

Yutaka Sasaki, Yokohama, and Kiyoshi Moriya, Kanagawa, both of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 191,091
Claims priority, application Japan, Sep. 25, 1979, 54-122815
Int. Cl.³ C22B *30/02;* C01B *19/02*
U.S. Cl. 75—69 10 Claims

1. A method for separating tellurium from a tellurium-antimony-containing metal oxide catalyst comprising heating the tellurium-antimony-containing metal oxide catalyst at a temperature of from about 900° C. to about 1,000° C. in a non-reducing gaseous atmosphere to evaporate the tellurium component separately from the antimony-containing catalyst.

4,324,587

PROCESS FOR MAINTAINING MAGNESIUM-CONTAINING CAST IRON MELTS IN A CASTABLE STATE

Richard Schlüsselberger, Vienna, Austria, assignor to Elin-Union AG, Vienna, Austria

Filed Sep. 22, 1980, Ser. No. 189,167
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 B 9 Claims

1. In a process for casting an iron-magnesium alloy in a closed furnace, the improvement in combination therewith comprising
the steps of
supplying a gas atmosphere from the outside into said furnace, said atmosphere comprising an inert gas and magnesium vapour to protect said magnesium-containing iron melt from oxidation,
retaining said protective gas atmosphere above the surface

of the melt, above the boiling point of magnesium of 1102° C., and

maintaining at least as high a partial pressure of magnesium vapour in said protective atmosphere as said magnesium vapour pressure within said melt.

4,324,588

ARC EROSION RESISTANT COMPOSITE MATERIALS AND PROCESSES FOR THEIR MANUFACTURE

Edward D. Zysk, Livingston, and Robert Stephans, Westwood, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Aug. 17, 1979, Ser. No. 67,268

Int. Cl.³ B22F *3/00, 3/02, 7/04*

U.S. Cl. 75—208 R **5 Claims**

1. A method for obtaining arc erosion-resistant composite material for use with electrodes, which method comprises:

compressing a core of green state pellets of (a) an arc erosion resistant material selected from the group consisting of ruthenium, iridium, alloy of ruthenium, alloy or iridium, alloy of ruthenium and iridum, and mixtures thereof, and (b) a matrix metal selected from the group consisting of silver, copper, gold, palladium, nickel, alloys thereof, and mixtures thereof;

inserting said core into a close-fitting tube of a material selected from the group consisting of nickel and nickel alloy;

sealing said tube; and

reducing the diameter of said tube by cold working to a predetermined outside diameter.

4,324,589

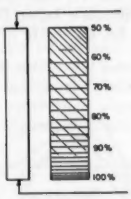
SOLUTE MONITORING PROCESS

Michael Gulla, Sherborn, Mass., and Barry J. Hartnett, Nashua, N.H., assignors to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 9,542, Feb. 5, 1979, Pat. No. 4,229,218. This application Jan. 29, 1980, Ser. No. 116,579

Int. Cl.³ C23C *3/02*

U.S. Cl. 106—1.22 **32 Claims**



1. A process for monitoring the concentration of a plating metal in an electroless plating solution during use of the same and plate-out of the metal, said process comprising the steps of plating metal from said solution observing light passing through the solution containing a colorant, which observed solution remains capable of depositing metal over a catalytic surface in the absense of electricity, where the colorant is selected to absorb and transmit light in portions of the spectrum differing from those portions of the spectrum where the plating metal in solution absorbs and transmits light and where the colorant and the plating metal in solution have maximum transmittance at wavelengths separated by at least 50 millimicrons and the wavelength of the maximum transmittance of the plating metal in solution is within 50 millimicrons of the wavelength for the maximum absorption by the colorant; whereby the perceived color of the plating solution will change as the concentration of the plating metal changes, and correlating the color of the solution with the concentration of the plating metal.

4,324,590

FIXATIVES FOR DENTISTRY AND THEIR USE

Hans H. Schulz, Leichlingen; Walter Uerdingen, Berg.Gladbach, and Kuno Wagner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,210

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703709

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—35 **8 Claims**

1. A two-component composition for use in forming a solvent-free fixing material suitable for use in dentistry, which fixing material is liquid at room temperature and has a viscosity in the range of from 5,000 to 100,000 cP, said composition having a first component comprising, at least one organic polyioscyanate with aliphatically and/or cycloaliphatically bonded isocyanate groups; and a second component comprising (a) at least one polyhydroxy-polyester having a molecular weight in the range of from 200 to 20,000 being substantially free of ether groups, and having at least 2 aliphatically bonded OH groups and (b) from 1 to 60% by weight, relative to the total mixture, of monohydric and/or polyhydric alcohols with a molecular weight below 200 and/or from 0 to 40% by weight, relative to the total mixture, of oligomeric polyesters containing at least 2 OH groups or ester-diols, with an average molecular weight of from 100 to 500, the first and second components of the mixture being present in amounts corresponding to a NCO/OH ratio of 1:1.

4,324,591

MODIFYING AGENTS FOR ION-LEACHABLE CEMENT COMPOSITIONS

Charles H. Beede, East Brunswick, and Richard N. Zirnite, Somerset, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 7, 1980, Ser. No. 204,984

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—85 **20 Claims**

1. In a cementitious composition comprising dry, ion-leachable glass powder, the improvement wherein said composition further comprises an essentially water insoluble, non-hydroxylic polycaroxylic aromatic compound having a solubility of less than 5 grams per 100 grams of water at room temperature.

4,324,592

CARTRIDGE CONTAINING FAST ACTING INORGANIC ADHESIVE SYSTEMS, GROUTING COMPOSITIONS AND METHOD OF USE

Natvarlal K. Patel, Warrensville Heights, and Anthony C. Plaisted, North Royalton, both of Ohio, assignors to Celtite, Inc., Cleveland, Ohio

Filed Dec. 10, 1979, Ser. No. 102,065

Int. Cl.³ C04B *9/04*

U.S. Cl. 106—85 **26 Claims**

23. A grouting composition produced from mixing together first and second components, said first component being a paste including 10 to 30% by weight of total system of magnesium oxide and 1 to 3% by weight of total system of a dispersing agent, said second component being a paste including 10 to 25% by weight of total system of a dihydrogen phosphate salt and 2 to 10% by weight of total system of a combination of trisodium phosphate and an agent selected from the group consisting of a polyphosphate salt and an alkyl acid phosphate or both, the balance being at least one filler and other ingredients.

4,324,593

SHAPEABLE TERTIARY AMINE N-OXIDE SOLUTION OF CELLULOSE, SHAPED CELLULOSE PRODUCT MADE THEREFROM AND PROCESS FOR PREPARING THE SHAPEABLE SOLUTION AND CELLULOSE PRODUCTS

Julianna K. Varga, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Sep. 1, 1978, Ser. No. 938,906
Int. Cl.[3] C08J 3/06, 3/08; C08L 1/02
U.S. Cl. 106—203 29 Claims

1. In a process for preparing a solution containing cellulose dissolved in a solvent containing a tertiary amine N-oxide, the improvement which comprises dissolving the cellulose in a solvent containing both a tertiary amine N-oxide and an alkaline compound which increases the rate at which the cellulose dissolves in the solvent.

4,324,594

METHOD FOR CLEANING METAL PARTS

Jack W. Chasteen, Ketering, Ohio, assignor to University of Dayton, Dayton, Ohio

Continuation-in-part of Ser. No. 874,915, Feb. 2, 1978, Pat. No. 4,188,237. This application Feb. 6, 1980, Ser. No. 119,060
The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.
Int. Cl.[3] B08B 5/00
U.S. Cl. 134—2 6 Claims

1. In a method for brazing or otherwise metallic bonding metal parts comprising cleaning said parts to depassivate the surface and thereafter brazing or forming a metal-metal bond, the improvement which comprises cleaning said parts by a process consisting essentially of:

(a) placing the part in a hermetically sealed passage having inlet and outlet gas ports,

(b) locating a fluorocarbon resin in said passage upstream of said part,

(c) heating said fluorocarbon resin to above its decomposition temperature to release gaseous decomposition products,

(d) introducing hydrogen gas through said inlet port and flowing it past said fluorocarbon resin and, then, past said part to carry the decomposition products through said passage and toward said outlet port and thereby subject said part to the action of the gases in said passage and render said part brazable or otherwise able to form a metal-metal bond, and

(e) exiting the gas from said outlet port.

4,324,595

METHOD FOR REMOVING TACKY ADHESIVES AND ARTICLES ADHERED THEREWITH

Kenneth A. Kasprzak, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1979, Ser. No. 71,453
Int. Cl.[3] B08B 3/08
U.S. Cl. 134—38 5 Claims

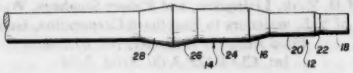
1. A process for removing a pressure-sensitive adhesive from a substrate, said adhesive having tack, as measured by ASTM D2979-71, said process comprising applying a composition consisting essentially of a volatile methylsiloxane fluid to said adhesive and removing the thus-treated adhesive from said substrate, said volatile methylsiloxane fluid being sufficiently volatile to leave substantially no residue after 30 minutes at room temperature when 1 gram thereof is placed at the center of a No. 1 circular filter paper having a diameter of 185 mm. and being supported by its perimeter in an open room atmosphere.

4,324,596

METHOD FOR SUBSTANTIALLY COLD WORKING NONHEAT-TREATABLE ALUMINUM ALLOYS

Robert A. Wuebker, Westerville, Ohio, assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 29, 1980, Ser. No. 201,782
Int. Cl.[3] C22F 1/04
U.S. Cl. 148—11.5 A 16 Claims



1. A method of forming an article of an aluminum alloy by cold working comprising:

selecting a strain-hardened, H-tempered, nonheat-treatable aluminum alloy bar;

cold working an end of said bar to create a first and second reshaped portion;

selectively heating said second reshaped portion to regain ductility; and

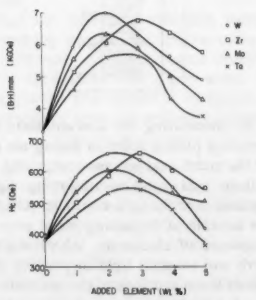
selectively cold working said second reshaped portion.

4,324,597

MAGNETIC ALLOY

Kimiyaki Kamino, Tokyo, and Masakatsu Fukuda, Sendai, both of Japan, assignors to Mitsubishi Seiko Kabushiki Kaisha, Japan

Continuation of Ser. No. 965,285, Dec. 1, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,723
Claims priority, application Japan, Dec. 27, 1977, 54/156429
Int. Cl.[3] H01F 1/02
U.S. Cl. 148—103 3 Claims



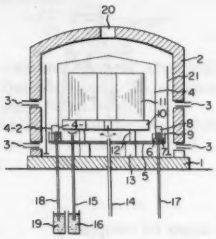
1. In a five element spinodal decomposition-type magnetic alloy consisting essentially of, by weight, 5 to 30% Co, 15 to 35% Cr, 0.1 to 10% Ti, 0.1 to 10% V, and the balance being Fe, wherein the improvement comprises increasing the magnetic energy product of said alloy by the replacement of a portion of said Fe by about 0.1 to 5% of one element selected from the group consisting of W, Mo and Zr in an amount sufficient to increase said magnetic energy product of said alloy to greater than about 4 MGOe.

4,324,598

FINISH ANNEALING PROCESS FOR GRAIN-ORIENTED ELECTRICAL STEEL STRIP OR SHEET

Tetsuo Kimoto; Hisao Takahashi; Hiromichi Koshiishi; Yasuhiro Shinkai, all of Kitakyushu, and Toshimi Kawabata, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 209,300
Claims priority, application Japan, Dec. 7, 1979, 54/157996
Int. Cl.³ H01F 1/04
U.S. Cl. 148—111 8 Claims



1. In a process for finish annealing a grain-oriented electrical steel strip containing 2.0 to 4.0% Si in the form of a strip which has been subjected to a conventional series of operations including hot rolling, cold rolling and annealing, the improvement comprising:

coating said steel strip with an annealing separator having a water content of not more than 10%;

drying said coating on said strip;

forming said strip coated with said annealing separator into a coil;

positioning said coil within an inner cover of a combustion annealing furnace;

supplying an atmosphere gas into the interior of said inner cover and maintaining the pressure of said atmosphere gas within said inner cover at least 5 mm of water higher than the gas pressure exterior of said inner cover; and

carrying out combustion exterior of said inner cover and subjecting said inner cover, said interior of said inner cover and said coil within said inner cover to the heat of said combustion, and thereby finish annealing said coil, while preventing combustion gases resulting from said combustion from entering into said interior of said inner cover.

4,324,599

GELLED SLURRY EXPLOSIVE

Kenneth Range, Arlington, Va.; William J. Irwin, Port Hueneme, Calif.; Russell Reed, Jr., and Wallace E. Silver, both of Ridgecrest, Calif., assignors to The United States of America as repesented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1980, Ser. No. 144,483
Int. Cl.³ C06B 33/10
U.S. Cl. 149—39 8 Claims

1. An explosive composition comprising:

about 20 to about 40 weight percent "red water", a mixture of sellite and reaction products of sodium sulfite and trinitrotoluene isomers which includes sodium sulfite, sodium sulfate, sodium nitrite, sodium nitrate and water, such "red water" mixture being a by-product of the manufacture of trinitrotoluene,

about 20 to about 50 weight percent of propellant nitrocellulose;

about 10 to about 25 weight percent oxidizer;

about 7 to about 10 weight percent passivated aluminum; and

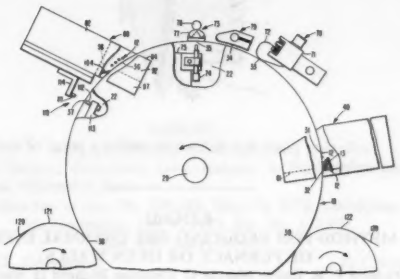
about 0.3 to 0.8 weight percent thickening agent.

4,324,600

INTRODUCING ELONGATED MAGNETIC ARTICLES INTO VACANT POSITIONS ON A CARRIER

Kristen E. Bankes, Reading; Donald M. Large, Temple; Fred J. Reinhard, Whitfield Reading, and Joseph A. Tamashasky, New Philadelphia, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,730
Int. Cl.³ B31C 1/00
U.S. Cl. 156—64 13 Claims



1. Apparatus for introducing elongated magnetic articles into vacant positions on a carrier, comprising:

a bin containing such articles, having a feed end in communication with the carrier and having spaced sidewalls with arm sections thereof extending substantially beyond the periphery of the carrier and along the sides thereof;

means for advancing the carrier along a path in communication with the articles in the bin;

means for establishing between and transverse to said sidewalls a first magnetic field of sufficient strength relative to the weight and material of the articles to orient and suspend such articles between the sidewalls; and

means for establishing between and transverse to the sidewall arm sections of the bin a second magnetic field of sufficient strength relative to the weight and material of the articles and the conditions on the carrier to introduce such articles into vacant positions on the carrier.

4,324,601

PREPARATION OF GLASS CONTAINER FOR THERMOPLASTIC CLOSURE

Michael T. Dembicki, and William J. Poad, both of Brockport, Pa., assignors to Brockway Glass Company, Inc., Brockway, Pa.

Continuation-in-part of Ser. No. 86,398, Oct. 19, 1979, Pat. No. 4,260,438. This application Feb. 10, 1981, Ser. No. 233,056
Int. Cl.³ B67B 3/00; B32B 17/10; C03C 15/00, 21/00
U.S. Cl. 156—69 14 Claims

9. A method for sealing an opening in a glass container having side walls comprising:

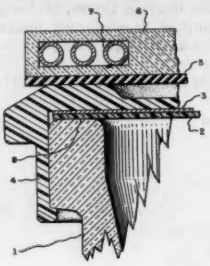
providing a rim-like sealing surface around said opening;

treating said sealing surface at a high temperature with a chemical agent which renders said surface adherable to a thermoplastic membrane;

coating the exterior surface of said container including said side walls with a lubricity enhancing agent;

removing said lubricity enhancing agent from only said sealing surface by briefly exposing said surface to an intense heat source and heating it to below flame polishing temperature while avoiding destruction by heat of the effect of the cold end treatment on the side walls;

pressing a membrane comprising a thermoplastic material against said sealing surface at a temperature above the softening point but below the melting point of said thermoplastic.



4,324,602

METHOD FOR REDUCING THE THERMAL INERTIA OF FURNACE OR OVEN WALLS

Richard P. B. Davis; Harold G. Emblem; Richard D. Shaw, and Stanley J. Shelley, all of Bromley, England, assignors to Zirconal Processes Limited, Bromley, England

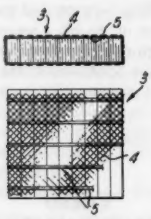
Continuation of Ser. No. 129,818, Mar. 12, 1980, abandoned, which is a continuation of Ser. No. 804,079, Jun. 6, 1977, Pat. No. 4,194,036, which is a division of Ser. No. 707,108, Jul. 20, 1976, abandoned. This application Dec. 15, 1980, Ser. No. 216,871

Claims priority, application United Kingdom, Jul. 29, 1975, 31736/75; Nov. 28, 1975, 49043/75

The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.

Int. Cl.³ B32B *31/26;* E04F *13/00;* F27D *1/16*

U.S. Cl. 156—71 **15 Claims**



1. In a method for reducing the thermal inertia of a furnace or wall oven by lining the oven with refractory fibers disposed with their ends end on to the wall, the improvement comprising

(i) compressing a plurality of modules of said refractory fibers disposed with one end, end on to the plane of one end of the modules, by wrapping the compressed modules in a thermally combustible material;

(ii) applying the modules side by side to a furnace or oven wall;

(iii) firing the furnace or oven to thermally destroy the wrapping material and release the modules from compression thereby causing each module to press against adjacent modules.

14. In a module for application to a furnace or oven wall to reduce the thermal inertia thereof and having refractory fibers with one end end on to the plane of one end of the module, the improvement comprising a wrapping of thermally combustible material which on first firing of the furnace or oven is thermally destroyed, said wrapping being disposed about said module to hold said module in elastic compression whereby, when said wrapping is thermally destroyed, said module is released from compression and free to expand.

4,324,603

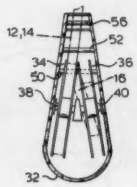
HOSIERY REPAIR KIT

Janice L. Crandall, and Richard W. Crandall, both of 150 W. Huron, Chicago, Ill. 60610

Filed Jul. 30, 1979, Ser. No. 62,510

Int. Cl.³ B32B *35/00*

U.S. Cl. 156—584 **6 Claims**



1. A hosiery repair kit comprising:

a tape including a repair layer having a textured appearance, and an adhesive layer on said repair layer;

a peel-off removable support layer carrying said adhesive layer, with repair and adhesive layers to be removed from said support layer so that said repair layer may be applied to a hose and adhered thereto by said adhesive layer;

said carrier means comprising a first reel having said tape wound thereon,

a second reel mounted for rotation with said first reel to take up the removable support layer after the same has parted from said adhesive layer; and

a single spindle mounted for rotation; said first and second reels fixedly mounted on said spindle for mutual rotation.

4,324,604

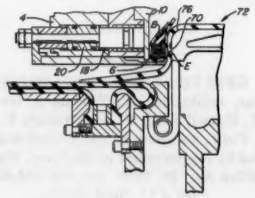
BEAD SETTING APPARATUS WITH RETRACTABLE FLANGE

Joseph H. Alexander, Kent, and Frank R. Jellison, Canton, both of Ohio, assignors to The General Tire & Rubber Co., Akron, Ohio

Filed Dec. 22, 1978, Ser. No. 972,317

Int. Cl.³ B29H *17/22*

U.S. Cl. 156—131 **3 Claims**



3. A method of setting a bead ring against the plies of a tire carcass overhanging the shoulder of a tire building drum, including the steps of carrying said bead ring on the support flange of a carrier member to a first position spaced axially from said building drum shoulder, then expanding said building drum with said carcass plies thereon, thereby causing the end portions of said carcass plies to be drawn around the drum facing edge of said support flange and toward the end face of said building drum, characterized by the steps of:

(1) moving said carrier member further toward said drum from said first position to press said bead ring and said support flange against said carcass ply end portions and

also to press said carcass ply end portions against the end face of said building drum, while allowing said support flange to move axially with respect to said carrier member under the pressure of the engagement of said support flange with said carcass ply end portions;

(2) sliding said support flange on said carrier member axially away from said tire building drum to release the hold that said carrier member and support flange have on said bead ring, and

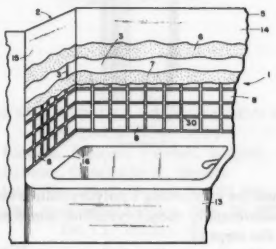
(3) then moving said carrier member axially away from said tire building drum, leaving said bead ring pressed against said end portions of said carcass plies overhanging said building drum shoulder.

4,324,605

TILING ARRANGEMENT AND METHOD

James R. Bethea, Denham Springs, La., assignor to Noble Manufacturing Company, Baton Rouge, La.

Filed Nov. 4, 1980, Ser. No. 203,985
Int. Cl.³ B32B *3/14, 31/04*
U.S. Cl. 156—247 **31 Claims**



1. A method for forming a watertight barrier between ceramic tile and a supporting substrate therefor, comprising:

providing a sheet of imperforate, substantially waterproof material having a dry, solvent-based film adhesive on one side thereof;

adhering the other side of said waterproof sheet to said substrate;

applying a tile adhesive over the film adhesive on said waterproof sheet one side; said tile adhesive having a solvent of said film adhesive therein for partially dissolving said film adhesive, and a cross-linking agent to interlink said tile and film adhesives and securely bond the same to said waterproof sheet;

pressing said ceramic tile into said tile adhesive; and

curing said adhesives.

4,324,606

PROCESS FOR FORMING A REINFORCED MEMBRANE

Michael S. Withers, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 107,521, Dec. 27, 1979, abandoned. This application Feb. 14, 1980, Ser. No. 121,461
Int. Cl.³ B29C *19/02*
U.S. Cl. 156—272.2 **10 Claims**

1. A process for continuously forming a reinforced membrane comprising

(1) continuously bringing at least two films of melt-fabricable fluorinated polymer which contain side chains containing sulfonyl and/or carboxyl functional groups in melt fabricable form and a web of reinforcing material into face-to-face contact such that proximate surfaces of two of said films contact opposite planar surfaces of said web, and moving the resulting combination of said films and said web vertically, unsupported except at two opposite edges thereof,

(2) applying vacuum to said combination at only the two opposite edge portions thereof, whereby air is removed from between said films,

(3) applying heat to the two outermost opposite planar film surfaces, first in the center portions thereof and progressively moving toward and including the edge portions thereof, and

(4) cooling the resulting reinforced membrane.

4,324,607

HOSE BUILDING MACHINE

Doyle Dugger, Muscatine, Iowa, assignor to Bandag Incorporated, Muscatine, Iowa

Continuation of Ser. No. 909,183, May 24, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,972
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—350 **13 Claims**

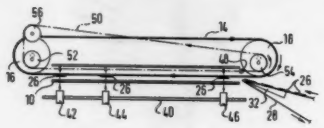
1. A machine for building a steel wire reenforced laminated rubber hose in a controlled cycle by depositing the several separate layers of rubber and wires to be laminated together on a generally cylindrical mandrel in a condition to be cured and stripped therefrom, comprising a means to support the mandrel to rotate about its longitudinal axis, variable speed drive means to rotate said mandrel, carriage means reciprocably movable in a path parallel to the axis of said mandrel, drive means to simultaneously reciprocate said carriage means in said path while said mandrel rotates, a first supply means of said carriage for delivering a rubber material in strip form in a controlled sequence from the carriage to the mandrel to be wrapped in a spiral so that each strip forms a layer around the exposed outer surface on the mandrel, other supply means for delivering multiple strands of wire in an alternate sequence of wrapping, said other supply means including let-off means having a plurality of individually rotatable sheaves positioned on said let-off means so that each sheave cooperates with an individual wire, and means for braking the rotational motion of each sheave to produce tension in each of said wire strands passing through the let-off means, means to place the individual strands of wire under tension as they are being positioned in a spiral layer around the exposed outer surface on the mandrel, and means for precisely coordinating the relative rotation of said mandrel and the reciprocation of said carriage whereby the multiple strands of rubber and wire are laid in an exact pattern on the surface of the mandrel to form their respective layers that cover the entire surface thereof, said means including a computer system which monitors rotation of said mandrel and which controls said drive means for said reciprocating carriage so that said mandrel and carriage move in a predetermined ratio without any accumulation of error, said means for precisely coordinating the relative rotation of said mandrel and the reciprocation of the carriage also including means arranged to precisely rotate the mandrel through a portion of one revolution at the start of each of said steps of wire wrapping whereby to produce the precise laydown of all of the wires over the entire surface on which the strands of wire are wrapped.

4,324,608

LABELING APPARATUS

Max H. Klinger, Obere Ringstrasse 54, D-4901 Hiddenhausen, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,234
Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019506
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—351 8 Claims



1. Labeling apparatus for the transfer of self-adhesive labels from label carrier means to material to be labeled, comprising

(a) conveyor means moving transversely to the path of the material to be labeled;

(b) means adjacent one end of said label carrier means laterally of said path for redirecting said label carrier means and for transferring said labels to said conveyor means;

(c) an indicator movable transversely of said path oppositely to and in synchronism with the movement of said conveyor means;

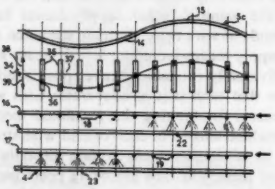
(d) at least one sensor means for scanning said indicator, said sensor means being arranged laterally of the path of movement of said indicator and being adjustable transversely of said path of the material to be labeled, and producing a signal for controlling the drive of said label carrier means upon passage of said indicator.

4,324,609

HUMIDIFIER ARRANGEMENT FOR A TRAVELLING HYDROPHILIC WEB

Gabriel Corradi, Soissons, France, assignor to Sarl dite: Astin-France-Assistance Technique Industrielle, France

Filed Jun. 3, 1980, Ser. No. 156,023
Claims priority, application France, Jun. 8, 1979, 79 15212
Int. Cl.[3] B32B *31/06, 31/08, 31/12;* B05C *5/00*
U.S. Cl. 156—470 6 Claims



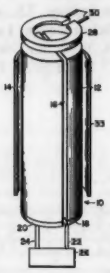
1. A humidifier arrangement for at least one web of travelling hydrophilic material, which arrangement is intended to distribute humidity in a pre-determined manner over the width of the web in order to correct any tendency thereof towards warping of a material formed by the connection of this first web face to face with a second web, the arrangement comprising a first table over which the web can travel, a plurality of jets arranged tranversely in association with said first table and located upstream thereof with respect to the direction of travel of the first web over said first table and opposite the intended path of at least one side of the first web, and means for the individual regulation of the rate of flow of humidifying liquid through each jet, which means comprise a control table, and a slide for each jet for regulating the rate of flow through the respective jet, the various slides corresponding to the various jets being able to move longitudinally with respect to said control table so that the position of the slides on said control table for a given flow regulation provides a visualisation of the shape of the cross-section of material which is to be corrected by this regulation.

4,324,610

METHOD FOR THE CONTROLLED MELTING OF SEMICONDUCTOR BODIES

Donald R. Clement, Phoenix, and Roger G. Nikirk, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1978, Ser. No. 888,072
Int. Cl.[3] C01B *15/18*
U.S. Cl. 156—602 10 Claims



1. A method for converting a polycrystalline semiconductor body to a substantially monocrystalline semiconductor body comprising the steps of:

dividing said polycrystalline body into electrically isolated vertical segments separated by a narrow gap and having a top portion; connecting each of said segments to a source of electrical power; providing a radio frequency induction coil located in proximity to said top portions of said segments and connected to a source of radio frequency power; induction heating said top portions of said segments by means of said induction coil to cause said top portions to melt; allowing the molten material so formed to flow into said gap and to electrically connect together said segments; passing current from said source of electrical power through said segments and said molten material to resistance heat said segments; continuing said induction heating and said resistance heating, said resistance heating and said induction heating together being sufficient to maintain a mass of molten semiconductor material on said top portions; inserting a semiconductor seed crystal into said mass of molten material and pulling said substantially monocrystalline semiconductor body therefrom.

4,324,611

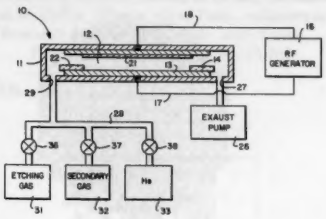
PROCESS AND GAS MIXTURE FOR ETCHING SILICON DIOXIDE AND SILICON NITRIDE

Diane C. Vogel, Fremont; Marian C. Tang, Rodeo, and Richard F. Reichelderfer, Castro Valley, all of Calif., assignors to Branson International Plasma Corporation, Hayward, Calif.

Filed Jun. 26, 1980, Ser. No. 163,386
Int. Cl.[3] H01L *21/306;* C03C *15/00, 25/06;* B44C *1/22*
U.S. Cl. 156—643 13 Claims

1. In a process for etching silicon dioxide and/or silicon nitride on a substrate in a reactor having a chamber and a pair of spaced apart generally planar electrodes, the steps of: positioning the substrate between the electrodes, admitting a primary gas consisting of a pure carbon-fluorine gas into the

chamber at a pressure on the order of 1-3 torr, admitting a secondary gas containing hydrogen at a pressure on the order



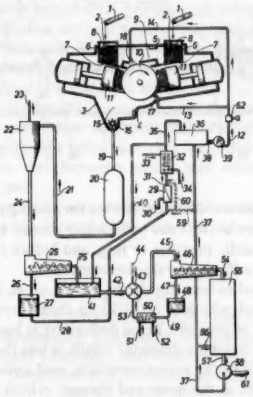
of 0.5-1.5 torr, and energizing the electrodes to ionize the gas and form a plasma between the electrodes.

4,324,612

PROCESS FOR THE PREPARATION OF GROUNDWOOD PULP

Jonas A. I. Lindahl, Domsjo, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Nov. 26, 1979, Ser. No. 97,466
Claims priority, application Sweden, Nov. 24, 1978, 7812111
Int. Cl.³ D21B *1/14*
U.S. Cl. 162—23 **11 Claims**



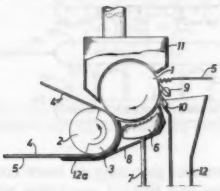
1. A process for preparing groundwood pulp from debarked pulpwood logs, which comprises grinding the logs in the presence of water under a superatmospheric pressure of a gas selected from the group consisting of steam, air, and steam and air, and forming and discharging a pulp suspension in the resulting aqueous liquor, while continuously supplying said water to the grinding in a volume of less than 35 parts per part of bone dry pulp at a rate of addition such that the temperature of the discharged pulp suspension is below 200° C. and within the range from about 1.5 to about 50 times the temperature in °C. of the added water, at a pressure within the range from about 8 to about 40 kiloponds/cm² higher than the superatmospheric pressure of said gas and at a temperature within the range from about 2° to about 63° C.

4,324,613

METHODS AND APPARATUS FOR THE RAPID CONSOLIDATION OF MOIST POROUS WEBS

Douglas Wahren, John Ericssonsq. 48, S-652 21 Karlstad, Sweden

Continuation of Ser. No. 21,442, Mar. 19, 1978, abandoned. This application Jun. 10, 1980, Ser. No. 158,080
Claims priority, application Sweden, Mar. 31, 1978, 7803672
Int. Cl.³ D21F *5/02*
U.S. Cl. 162—111 **18 Claims**



1. In a method for consolidating and drying a moist, porous web, the steps of running the web through the nip between a pair of rotatable rolls with one side in contact with one roll and its other side facing a permeable surface pressing the rolls together to develop a high pressure linear load in the press nip sufficient to produce good thermal contact between said one roll and the web at least in areas subjected to said high pressure linear load and to overcome any steam pressure developed between the web and said one roll, supplying heat to the outer surface of said roll as it approaches said nip at a rate such that the roll arrives at said nip with a temperature and heat content high enough to cause moisture in the web to be converted rapidly and violently into steam as the web passes through said nip, and heat is transferred rapidly from the surface of the roll directly to the web under high pressure, the steam thus formed tending to pass straight through the web, carrying with it any free water remaining in the cavities between the fibers of the web, whereby the steam is cooled and practically all of its heat energy is transferred to the web and the water remaining therein.

17. Apparatus for consolidating and drying a moist, porous web of material comprising:

a pair of rotatable rolls defining a nip;

means for running the web through said nip with one side in contact with the surface of one of said rolls and with the other side facing a permeable surface;

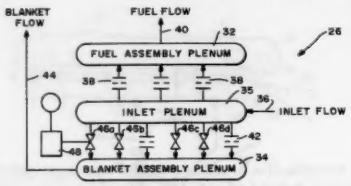
heating means disposed externally of said one roll for supplying heat to a portion of the outer surface thereof as it approaches said nip so that said surface portion is brought to a temperature and heat content high enough to cause the moisture in the web to be converted suddenly and violently into steam as the web passes through said nip, said heating means including conduit means having outlet means generally conforming to the shape of part of said one roll in closely adjacent relation to the surface thereof and disposed upstream of said nip, and means for supplying a liquid heating medium to said conduit means; and

means for pressing said rolls together so that a load is created which is sufficient to overcome any steam pressure developed between the web and said one roll in the nip area and sufficient to produce good thermal contact between the web and said one roll in said nip area, whereby heat is transferred rapidly from the surface of the roll directly to the web under high pressure, at least in said nip area.

4,324,614
FLOW DISTRIBUTION SYSTEM FOR COOLANT IN A NUCLEAR REACTOR AND METHOD

Edward Moody, Simi, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 23, 1979, Ser. No. 32,361
Int. Cl.[3] G21C *15/04*
U.S. Cl. 376—175 4 Claims



1. In a nuclear reactor including an inner core containing both fuel assemblies and blanket assemblies and means for cooling the assemblies by passing liquid coolant across and in contact with the latter, a flow distribution system comprising an inlet plenum having inlet means for receiving a continuous supply of said coolant, a fuel plenum including a plurality of inlets remaining opened at all times during operation of the reactor for continuously receiving coolant from said inlet plenum, a blanket plenum including at least one inlet remaining opened at all times during operation of the reactor for continuously receiving a lesser amount of coolant from said inlet plenum than the amount passing into said fuel plenum through its plurality of inlets, said fuel and blanket plenums being in fluid communication with said fuel assemblies and blanket assemblies, respectively, for passing received coolant across and in contact with said assemblies, and means for automatically changing the distribution of coolant between said fuel and blanket plenums in response to predetermined changes in temperature at said assemblies, said distribution changing means including a plurality of second inlets into said blanket plenum from said inlet plenum and an equal plurality of valve means for opening predetermined ones of said second inlets at different times as the temperature at said blanket assemblies increases for automatically increasing the amount of coolant passing into said blanket plenum and decreasing the amount of coolant passing into said fuel plenum whereby to provide said change in coolant distribution, said valve means including means responsive to said temperature changes for opening said second inlets, whereby increases in temperature at said blanket assemblies cause an increase of said coolant to be distributed to said blanket plenum for passage to said blanket assemblies and an automatic decrease in coolant to be distributed to said fuel plenum for decreasing the amount of coolant passing to said fuel assemblies.

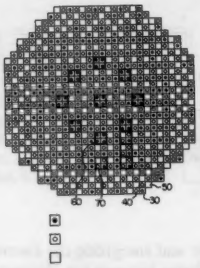
4,324,615
CONSTRUCTION OF NUCLEAR REACTOR CORE

Yasuhiro Kobayashi, Hitachi, and Renzo Takeda, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1979, Ser. No. 98,633
Claims priority, application Japan, Nov. 29, 1978, 53-146538
Int. Cl.[3] G21C *19/20*
U.S. Cl. 376—267 7 Claims

1. In a nuclear reactor core having a plurality of fuel units arranged in the central region of the reactor core and occupying more than 50% of the total area of the reactor core, each fuel unit including four adjacent fuel assemblies which adjacently surround one control rod, said fuel assemblies of each fuel unit being adapted to be replaced one by one at each of successive fuel replacement cycles,

an improvement wherein each of said fuel units in the state of an initial core includes one poison-containing fuel assembly, and three other assemblies containing no poison

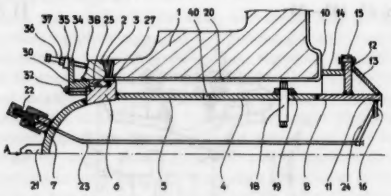


and having mean enrichments lower than that of said poison-containing fuel assembly.

4,324,616
DETACHABLE AND LEAKTIGHT DEVICE FOR CLOSING AN ORIFICE OF A NUCLEAR REACTOR VESSEL

Andre Marmorat, and Rene Montaron, both of Le Creusot, France, assignors to Framatome, Courbevoie, France

Filed Mar. 7, 1980, Ser. No. 127,969
Claims priority, application France, Mar. 7, 1979, 78 05856
Int. Cl.[3] G21C *19/20*
U.S. Cl. 376—203 5 Claims



1. A removable and leaktight device for closing the orifice of a pipe connection in the vessel of a water cooled nuclear reactor during hydraulic pressure testing, and before connecting a pipe for primary fluid, said device comprising:

a body adapted to bear, inside the vessel, on an internal part of the vessel which is resistant to thrust stresses during application of pressure, being defined by at least one cylindrical shell having a diameter which is less than the internal diameter of the pipe connection, said cylindrical shell being joined, at the inner end thereof, which inner end is intended to enter the vessel, to a bearing member for bearing on the internal part of the vessel, and being fixed at the outer part thereof, to be located near the exterior of the vessel, with a ring and a curved cover closing said shell and producing an entirely closed structure relative to the exterior of the vessel,

sealing means comprising a set of annular gaskets being carried by said ring and located, when said device is in position in the pipe connection, between an external surface of said ring and an internal surface of the outer end of the pipe connection,

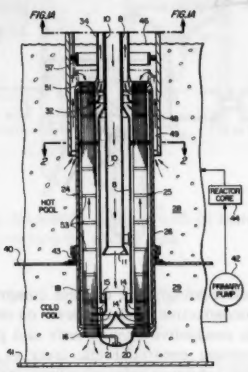
and operating means for fixing said device comprising a clamping flange, means for fixing said clamping flange to said ring, and clamping screws for bearing on the outer end of the pipe for exerting a tractive stress on said clamping flange and on the remainder of said device.

4,324,617

INTERMEDIATE HEAT EXCHANGER FOR A LIQUID METAL COOLED NUCLEAR REACTOR AND METHOD

Michael G. Sowers, Hixson; Ronald B. Creek, Chattanooga, and Donovan D. DeFur, Hixson, all of Tenn., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 27, 1979, Ser. No. 34,165
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—405 11 Claims



1. A tube and shell heat exchanger for a liquid metal cooled, multi-pool, nuclear reactor comprising:

(a) a plurality of thermally uncompensated tubes mounted in a heat exchanger for carrying a liquid metal heating fluid from a hot pool to a cold pool in the nuclear reactor;

(b) a thermally uncompensated and thermally expandable heat exchanger shell enclosing said tubes for bringing a liquid metal heated fluid into thermal communication with both said tubes and said heating fluid thereby heating said heated fluid, said shell being simultaneously immersed in both the hot pool and the cold pool to an extent that the temperature of the shell is higher than the temperature of the tubes whereby to cause said shell to expand to a greater extent than said tubes, said shell being inter-connected with said tubes such that the difference in thermal expansion therebetween places said tubes in a state of tension; and

(c) nozzle means connected to the heat exchanger shell for directing the heated fluid into and out of said heat exchanger.

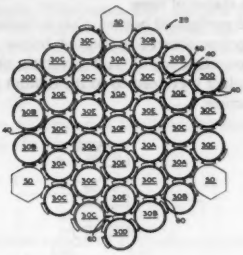
4,324,618

FUEL ELEMENT ASSEMBLY

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 8, 1979, Ser. No. 47,591
Int. Cl.³ G21C *3/08*
U.S. Cl. 376—434 4 Claims

1. A tight lattice fuel element assembly for a pressurized-water cooled nuclear converter reactor comprising: a multiplicity of fuel rods disposed in a spaced parallel array having an equilateral triangular pitch for all of said fuel rods and longitudinal coolant channels between multiple adjacent fuel rods for a generally longitudinal coolant flow, one or more longitudinal fins formed on at least some of said fuel rods disposed serially at equally spaced common axial intervals, said fins having an equal angular orientation relative to the longitudinal axis of the fuel rods, each of said fins extending over a portion of the circumference of the fuel rods and between adjacent coolant channels, each of said fins spirally rotating in the same direction, each of said fins having a peripheral point in contact with and joined to an outer cylindrical portion of an adjacent fuel rod, and said points in each axially spaced series lying in substantially the same transverse plane whereby a



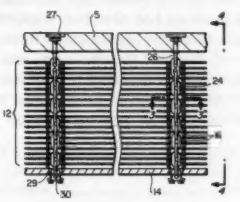
transverse flow component part of the longitudinal coolant flow is established throughout the fuel element assembly.

4,324,619

APPARATUS FOR SUSPENDING THERMAL SHIELDING WITHIN A NUCLEAR REACTOR

William F. Guerin, Greensburg, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 1, 1979, Ser. No. 80,515
Int. Cl.³ G21C *13/04*
U.S. Cl. 376—290 3 Claims



1. Apparatus for suspending thermal shielding within a nuclear reactor, comprising: (a) a nuclear reactor having a core wherein heat is produced by nuclear fission and a reactor vessel housing the core and liquid metal coolant and having a deck means which provides an upper horizontal boundary for the reactor; (b) a plurality of horizontally disposed thermally reflective plates; and (c) a plurality of horizontally deformable chains having interconnected links, said chains being connected to the deck and the reflective plates so that the transfer of heat from the liquid coolant above the reactor core to the deck is substantially reduced and said chains being connected to the lower surface of the deck so that the reflective plates are suspended therefrom.

4,324,620

PYROLYZING APPARATUS

Kanichi Ito, Yokohama; Yoshio Hirayama, Zushi; Yoshiaki Ishii, and Naoyoshi Ando, both of Yokohama, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Dec. 5, 1979, Ser. No. 100,406
Int. Cl.³ C10B *15/00, 21/10, 49/10, 49/22*
U.S. Cl. 202—89 9 Claims

1. A pyrolizing apparatus of a fluidized bed type comprising:

a vessel having a perforated bottom plate;

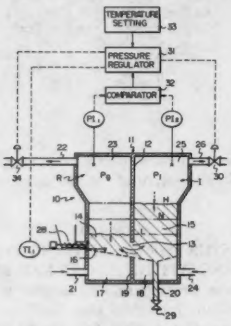
a pyrolysis fluidized bed chamber above said plate in said vessel;

an incineration fluidized bed chamber above said plate in said vessel, said chambers being in communication with each other at the lower portions of said chambers above said plate; and

means for regulating the pressure difference between the free boards of said chambers;

wherein said regulating means regulates said pressure difference with elapse of time;

wherein said perforated bottom plate is inclined so that the lowest portion thereof is located below either of said incineration chamber or said pyrolysis chamber, and a discharge duct is connected to the bottom plate at its said lowest portion;



wherein a pyrolysis gas chamber and an incineration gas chamber are provided under said perforated bottom plate and below said pyrolysis fluidized bed chamber and said incineration fluidized bed chamber, respectively;

wherein said gas chambers are separated from each other by a dividing wall disposed therebetween; and

wherein the position of said dividing wall is arranged to be adjustable so that a pyrolysis gas chamber may extend to a region partially below said incineration fluidized bed chamber.

4,324,621

METHOD AND APPARATUS FOR CONTROLLING THE QUALITY OF ELECTROLYTES

Robert C. Kerby, Rossland, Canada, assignor to Cominco Ltd., Canada

Continuation-in-part of Ser. No. 107,180, Dec. 26, 1979, abandoned. This application Jun. 26, 1980, Ser. No. 163,282

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **38 Claims**

1. A method for controlling a process for the electro deposition of a metal using an electrolyte containing concentrations of impurities, said method comprising the steps of establishing a test cell, a sample of electrolyte, a moving cathode, made of an electrically conductive material other than the metal being deposited, which moving cathode has an area exposed to said electrolyte, an anode, and a reference electrode, said electrodes being immersed in said sample, a constant current supply and measuring means electrically connected to said electrodes; applying a low current to the electrodes in said test cell, said current being sufficient to cause inchoate desposition of said metal or said cathode; measuring the activation overpotential at the point of inchoate deposition of said metal; relating the measured activation overpotential to the concentration of impurities in said sample; and adjusting the concentration of impurities in the electrolyte of the process for the deposition of metal to obtain optimum deposition of metal, wherein inchoate deposition is defined as the deposition of metal which has just begun and is limited to a partial covering of the moving cathode surface by deposited metal.

4,324,622

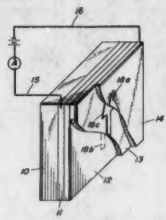
MULTILAYERED ELECTROPLATOGRAPHIC ELEMENT COMPRISING ION CONDUCTIVE AND ELECTROCHROMIC LAYERS

Satyendra K. Deb, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 509,578, Sep. 26, 1974, abandoned. This application Mar. 7, 1977, Ser. No. 774,728

Int. Cl.² G03G *5/00*

U.S. Cl. 430—63 **7 Claims**



1. An electrophotographic element comprising, on a support, a photoconductive insulating layer on an ion conductive layer and, in conductive contact with said photoconductive layer, a persistent electrochromic layer of solid inorganic electrochromic substance responsive upon the application of a critical voltage across said layer in an electric field of one polarity by changing without chemical transfer, from a first absorption state to second absorption state and responsive upon the application of said critical voltage in a field of opposite polarity by changing without chemical transfer, from said second state to said first state, said substance being persistent in either of said states without chemical fixing after discontinuing the application of said critical voltage and being reversibly changeable at said critical voltage from either of said first and second states to the other, the reversible changes of absorption states in said electrochromic substance being the appearance and disappearance, respectively, of a radiation absorption band in the absorption spectrum of said substance, which band is created upon the change to one state and destroyed upon the change to the other state.

4,324,623

METHOD AND APPARATUS FOR REPLENISHING AN ELECTROPLATING BATH WITH METAL TO BE DEPOSITED

Glenn R. Schaer, Columbus, Ohio, assignor to Koito Seisakusho Co. Ltd., Tokyo, Japan

Filed Jan. 7, 1981, Ser. No. 223,207

Claims priority, application Japan, Jan. 12, 1980, 55/2243

Int. Cl.³ C25D *5/00, 21/02, 21/06, 21/18*

U.S. Cl. 204—15 **11 Claims**

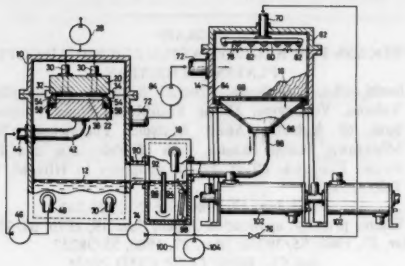
1. In a copper electroplating operation of the type wherein the copper is electrodeposited from an acid copper plating solution in a plating tank, a method of replenishing the plating solution with copper, which comprises:

(a) providing a solid-state supply of copper in an enclosed space;

(b) directing into the enclosed space the oxygen evolved within the plating tank with the progress of the electroplating operation;

(c) spraying the plating solution from the plating tank over

the copper supply in the oxygen-enriched atmosphere for dissolving the copper supply; and,



(d) returning the plating solution with its increased copper concentration into the plating tank.

4,324,624

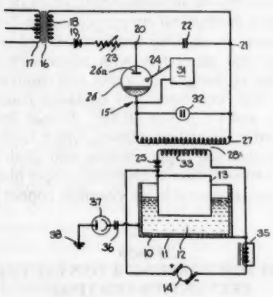
METHOD FOR THE ACTIVATION OF A COMPOSITION FOR FUSED BATH ELECTROLYSIS

Isaac M. Diller, 50 Park Ave., New York, N.Y. 10016

Continuation of Ser. No. 428,779, Dec. 27, 1973, abandoned, which is a division of Ser. No. 3,668, Jan. 19, 1970, Pat. No. 3,806,433, which is a continuation-in-part of Ser. No. 241,895, Dec. 3, 1962, Pat. No. 3,244,604, Ser. No. 305,768, Aug. 30, 1963, Pat. No. 3,392,092, and Ser. No. 539,906, Apr. 4, 1966, abandoned. This application Jun. 30, 1976, Ser. No. 701,200

Int. Cl.³ B01J *19/12;* **C25C** *3/06, 3/16*

U.S. Cl. 204—67 **31 Claims**



24. A process of activating a fused electrolyte comprising applying a high energy impulse by means of a firing electrode structure to a fused electrolyte in order to activate the electrolyte and thereby increase the yield of metal per kilowatt-hour for a given rate of production of an electrolytic cell for the electro-winning of aluminum when the activated electrolyte is electrolyzed in the cell, the firing electrode including a pair of electrode members adapted to be inserted into the melt, each of the members having an insulated lead portion adapted to extend into the melt and a leg portion extending at an angle from the lead portion and adapted to extend toward a vertical wall of the cell, said leg portion of each of said electrode members converging toward one another with the minimum gap between the electrodes being adjacent the free ends thereof, whereby the discharge of the impulse occurs between said leg portions.

4,324,625

PROCESS FOR PREPARING ALKANEDIOLS BY ELECTROCHEMICAL COUPLING OF HALOHYDRINS

Charles C. Cumbo, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,351, Aug. 14, 1979, abandoned. This application Jul. 29, 1980, Ser. No. 171,380

Int. Cl.³ C25B *3/10, 11/04, 13/08*

U.S. Cl. 204—72 **14 Claims**

1. A process for preparing an alkanediol from a halohydrin represented by the structure

HO—R—X

where

R is an alkylene radical of 2–4 carbon atoms and

X is iodine or bromine,

the process comprising

(A) passing a direct electric current through a divided electrolytic cell having a copper cathode and having

(1) a cathode compartment containing a catholyte which is an aqueous solution comprising

(a) the halohydrin,

(b) an electrolyte

(c) 0.01–1 mole per liter of a stabilizing ligand, and

(d) copper ions, and

(2) an anode compartment containing an anolyte which is an aqueous solution comprising

(e) an iodide or bromide and

(f) an electrolyte, the cathode compartment being separated from the anode compartment by an electroconductive diaphragm permeable to electrolyte cations; and

(b) recovering alkanediol from the catholyte.

4,324,626

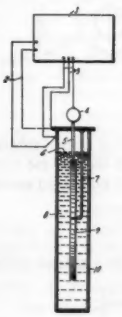
SELECTIVE REMOVAL OF NICKEL-BASED BRAZE ALLOY FROM NICKEL-BASED METALS

James F. McGivern, Jr., Avon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 93,655, Nov. 13, 1979, Pat. No. 4,261,804. This application Feb. 17, 1981, Ser. No. 235,199

Int. Cl.³ C25F *5/00, 3/00*

U.S. Cl. 204—146 **9 Claims**



1. A process for the selective removal of nickel-based braze alloy from nickel-based metal/nickel-based alloy composites comprising immersing at least one composite in a solution of electrolyte comprising 4% to 6% by volume sulfuric acid and about 0.5% to 5% by volume hydrochloric acid which is substantially non-corrosive to the nickel-based metal at voltages of 0.7 volt to 0.9 volt, imposing such voltage across the composite and potentiostatically controlling such voltage while the composite is immersed in the electrolyte producing a

nickel braze alloy/nickel-based metal current density ratio in the composite which selectively etches the nickel-based metal.

4,324,627

PROCESS FOR PREPARING 2-CHLORO-5-TRICHLOROMETHYLPYRIDINE

David Cartwright, Reading, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 29,341, which matured from PCT/GB78/00008 Filed Aug. 10, 1978, 102(e) date Apr. 11, 1979, 371 date Apr. 11, 1979. This application Aug. 27, 1980, Ser. No. 181,876

Claims priority, application United Kingdom, Aug. 12, 1977, 34039/77; Oct. 26, 1977, 44541/77; Feb. 9, 1978, 5230/78

Int. Cl.³ C07D *213/26*; B01J *19/08*

U.S. Cl. 204—158 HA **2 Claims**

1. A liquid phase process for preparing 2-chloro-5-trichloromethylpyridine, said process consisting essentially of dissolving dry 3-methylpyridine in a dry inert liquid organic solvent and then passing dry chlorine through the resulting liquid reaction medium, at 50° to 130° C. and under the influence of ultra violet light whereby the 3-methyl group of the 3-methylpyridine is trichlorinated and chlorine is also introduced into the 2-position so as to give 2-chloro-5-trichloromethylpyridine as the major product.

4,324,628

ALKYL-ARYL SULFOXIDES IN PHOTOINITIATING PROCESS AND PRODUCT

Lajos Avar, Biel-Benken; Hans-Werner Finck, Oberwil, both of Switzerland, and Evelyne Kalt, Riedisheim, France, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 49,572, Jun. 18, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,662

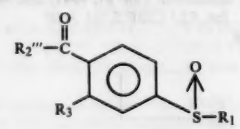
Claims priority, application Switzerland, Jun. 23, 1978, 6876/78; Oct. 16, 1978, 10692/78

Int. Cl.³ C08F *2/50*

U.S. Cl. 204—159.24 **13 Claims**

1. A photopolymerization process comprising irradiating a photopolymerizable material with U.V. light of wave length 250 to 400 nm in the presence of a photosensitizing amount of a photoinitiator of formula I,

I



in which

R_1 is (C_{1-12})alkyl, and

either

R_2''' is (C_{1-2})alkyl, phenyl or phenyl substituted by up to two (C_{1-9})alkyl groups with the proviso that the total number of carbon atoms in said combined substituents is 9,

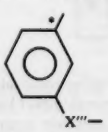
and

R_3 is hydrogen,

or

R_2''' and R_3 together form a radical of formula (b)

(b)



in which X''' is —S— or

and in which the carbon atom marked with the asterisk is bound to the

group in formula I.

4,324,629

PROCESS FOR REGENERATING CHEMICAL COPPER PLATING SOLUTION

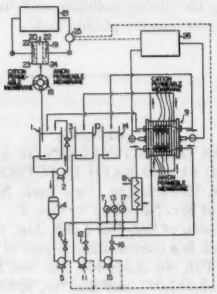
Hitoshi Oka, Yokohoma; Hiroshi Kikuchi, Zushi; Hitoshi Yokono, Yokohama; Haruo Suzuki; Toyofusa Yoshimura, both of Katsuta; Akira Matsuo, Yokohama; Osamu Miyazawa; Isamu Tanaka, both of Yokosuka, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,201

Claims priority, application Japan, Jun. 19, 1979, 54/77161; Mar. 27, 1980, 55/38236; Mar. 27, 1980, 55/38237

Int. Cl.³ B01D *13/02*; C25D *21/16*

U.S. Cl. 204—180 P **6 Claims**



1. A process for regenerating a chemical copper plating solution, which comprises adjusting pH of a solution containing copper ions, a reducing agent for copper ions, a chelating agent for copper ions and an alkali metal hydroxide as essential components, used in chemical copper plating, to 2–11, leading the plating solution to desalting compartments of an electrodialysis cell, provided alternately with anion exchange membranes and cation exchange membranes, and removing counter ions to copper ions, ions formed by oxidation reaction of the reducing agent, and CO_3^{-2} or HCO_3^- formed from carbon dioxide dissolved in the plating solution, which have an inhibiting effect upon chemical copper plating, and alkali metal ions which is free from inhibition of chemical copper plating, accumulated in the solution used in the chemical copper plating by electrodialysis.

4,324,630

METHOD FOR FORMING A DENTAL CARIES PREVENTIVE COATING

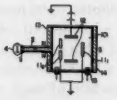
Toshio Sugita, 17-12, Takamatsu-Cho 2-Chome, Tachikawa-Shi, Tokyo; Takanobu Morinushi, 19-1-205, Ogikubo 5-Chome, Suginami-Ku, Tokyo, and Shigeharu Hanashima, 39-11, Mejirodai 1-Chome, Hachioji-Shi, Tokyo, all of Japan

Filed Jul. 31, 1980, Ser. No. 174,222

Claims priority, application Japan, Jul. 31, 1979, 54/96741

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **1 Claim**



1. Method for forming a dental caries preventive coating by ion sputtering consisting of;

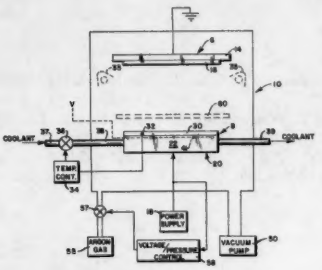
forming neutral or charged particles of metal, alloy, semiconductor or insulator in a discharge space; and

guiding said neutral or charged particles through a duct so that said particles reach selectively an limited portion of a tooth surface and form a coating covering said portion of the surface.

4,324,631
MAGNETRON SPUTTERING OF MAGNETIC MATERIALS

Benjamin B. Meckel, and Emily I. Bromley, both of Del Mar, Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Filed Jul. 23, 1979, Ser. No. 59,932
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 M **10 Claims**



1. An improved method for magnetron sputtering a magnetic target to produce a magnetic film having substantially the same magnetic properties as the magnetic target wherein the improvement comprises heating the magnetic target, by means of a heater capable of heating said target independent of said sputtering method, to a temperature substantially equal to or above its Curie temperature to render said target non-magnetic, and magnetron sputtering said target while in a non-magnetic state to produce a magnetic film on a substrate spaced from said target.

10. Apparatus for magnetron sputtering a magnetic target plate to produce a magnetic film on a substrate spaced therefrom, said apparatus comprising:

(a) a magnetron comprising a non-magnetic housing having magnetic means positioned therein, said magnetic means being adapted to produce magnetic flux at selected regions outside said housing;

(b) means for controlling the temperature of said housing;

(c) a magnetic target plate;

(d) thermally conductive spacer means for thermally coupling selected portions of said magnetic target plate with said housing, said spacer means being effective to thermally isolate other portions of the target plate from said housing, such other portions being arranged in said selected regions of the magnetic flux produced by said magnetic means;

(e) means for producing a gas plasma in the vicinity of said target plate thermally coupled with said housing and for attracting gas ions from said plasma toward such target plate, whereby the target plate is subjected to ion bombardment which causes at least the other portions of the target plate to be heated to a temperature substantially equal to or above the Curie temperature of the magnetic target plate, whereby said other portions of the target plate are rendered non-magnetic, allowing said magnetic flux to pass through the plate to densify said plasma;

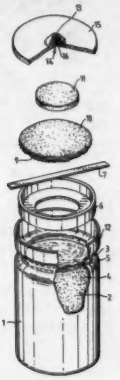
(f) means for monitoring the temperature of said target plate thermally coupled with said housing and for producing a signal representative of the target plate temperature; and

(g) means responsive to said signal and operatively coupled to said temperature controlling means for maintaining said other portions of said target plate thermally coupled with said housing at a temperature equal to or in excess of said Curie temperature.

4,324,632
GAS SENSOR

Anthony D. S. Tantram, Great Bookham, and Yat S. Chan, London, both of England, assignors to City Technology Limited, London, England

Filed May 15, 1980, Ser. No. 150,025
Claims priority, application United Kingdom, May 17, 1979, 17237/79
Int. Cl.³ G01N 27/30
U.S. Cl. 204—195 P **9 Claims**



1. An electro-chemical sensor for measuring concentrations of electro-chemically reactable gas or vapour in accordance with a limiting current principle, comprising:

a casing;

a sensing electrode;

a counter electrode;

a means for restricting gas or vapour access to said sensing electrode, said means comprising a porous diffusion barrier having a temperature co-efficient which is negative with respect to diffusion rate wherein substantially all active pores in said barrier are sufficiently small so that diffusion through them is in accordance with the Knudsen principle and diffusion occurs by a diffusion mechanism effectively determined solely by collisions between diffusing molecules and walls of pores in said barrier, said barrier proportioned such that the barrier's minimum linear dimension measured at right angles to the overall direction of diffusion is less than twice the mean linear dimension along the direction of diffusion.

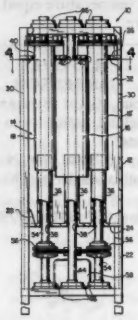
4,324,633
ELECTROLYTIC APPARATUS FOR TREATING CONTINUOUS STRIP MATERIAL

Curtis N. Lovejoy, 460 Matthew St., Bristol, Conn. 06010

Filed Oct. 20, 1980, Ser. No. 198,774
Int. Cl.³ C25D 17/06
U.S. Cl. 204—206 **10 Claims**

1. An electrolytic apparatus for treating continuous strip material comprising a tank and a contact roller assembly including a plurality of generally cylindrical rollers, means supporting said rollers for rotation about parallel axes, each of said rollers being at least partially disposed within said tank, said rollers cooperating to define a serpentine path along which strip material is constrained to pass in traveling through said tank, at least one of said rollers comprising an electrical contact roller having an electrically conductive surface and a diametrically enlarged annular flange, said flange having a

radially disposed contact surface, a brush holder supported in fixed position relative to said tank, and at least one brush carried by said brush holder and biased into electrically contacting engagement with said contact surface.

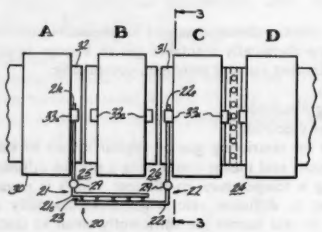


4,324,634

REMOTELY CONNECTING AND DISCONNECTING CELLS FROM CIRCUIT

Morton S. Kircher, Clearwater, Fla., and Steven J. Specht, Mentor, Ohio, assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 93,425, Nov. 13, 1979. This application Jan. 28, 1980, Ser. No. 116,366
Int. Cl.³ C25B 15/00, 9/04
U.S. Cl. 204—228 47 Claims



1. A method of by-passing and disconnecting one of a plurality of electrolytic cells connected in electrical series circuit while maintaining the remaining cells of said electrical series in operation, each of said cells having a cathode terminal, an anode terminal, and an intercell conductor for electrically connecting said anode and cathode terminals, which method comprises the steps of:

(a) positioning a jumper aside said series of cells;

(b) inserting a first portion of said jumper having two spaced apart members between a cell to be disconnected and the preceding cell in said series of cells;

(c) inserung a second portion of said jumper having two spaced apart members between said cell to be disconnected and the succeeding cell in said series of cells;

(d) contacting the cathode terminal of said preceding cell with said inserted first portion of said jumper at a location between said preceding cell and said cell to be disconnected while said cell to be disconnected is still fully connected to said preceding cell by remotely moing said two spaced apart members of said first jumper portion towards each other about and into contact with said cathode cell terminal of said preceding cell;

(e) contacting the anode terminal of said succeeding cell with said inserted second portion of said jumper at a location between said succeeding cell and said cells to be disconnected while said cell to be disconnected is still fully connected to said succeeding cell by remotely moving said two spaced apart members of said second jumper portions toward each other about and into contact with said anode cell terminal of said succeeding cell;

(f) electrically connecting said first and second jumper portions so as to electrically by-pass said cell to be disconnected; and

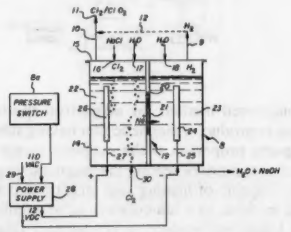
(g) remotely disconnecting said cell to be disconnected from said preceding and succeeding cells to thereby electrically by-pass said disconnected cell through said jumper.

4,324,635

GENERATION OF CHLORINE-CHLORINE DIOXIDE MIXTURES

Charles T. Sweeney, 448 Earle Rd., Hewitt, Tex. 76643

Filed Aug. 25, 1980, Ser. No. 180,674
Int. Cl.³ C25B 9/00
U.S. Cl. 204—266 1 Claim



1. An electrolytic gas generator for production of chlorine-chlorine dioxide mixtures comprising

a hollow container having a wall including a permeable cation exchange membrane, dividing said container into two compartments,

an anode positioned in one compartment and a cathode positioned in the other compartment,

an outlet from each of said compartments for removal of gasses therefrom,

an inlet to the bottom portion of said anode-containing compartment for continuous introduction of chlorine gas thereto,

inlets to the top portion of each of said compartments for introduction of a chloride salt solution to said anode-containing compartment and an aqueous electrolyte to said cathode-containing compartment,

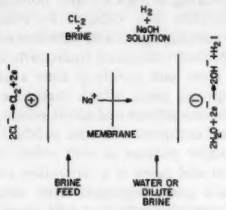
means for maintaining the pH of said anode-containing compartment in a predetermined range, comprising a pump and associated conduits for circulating caustic solution in controlled, selected amounts from said cathode-containing compartment to said anode-containing compartment and pH monitoring and controlling means controlling operation of said pump,

said generator being operable, when filled with an aqueous solution of chloride salt in said anode-containing compartment and with aqueous electrolyte in said cathode-containing compartment and energized, and circulating additional quantities of chlorine therethrough while maintaining said anode-containing compartment at pH 1.8–5.0, to produce a mixture of chlorine and chlorine dioxide therein.

4,324,636
ION EXCHANGE MEMBRANES

Joseph P. Dankese, 17 Arcadia St., Dorchester, Mass. 02122

Division of Ser. No. 33,550, Apr. 26, 1979, Pat. No. 4,243,508.
This application Aug. 3, 1979, Ser. No. 63,835
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.[3] G25B *13/08*
U.S. Cl. 204—296 17 Claims



1. An ion exchange membrane product comprising at least two polymeric components, a first component forming a chemically inert matrix structure formed of an ion exchange resin, the second component being a solid polymer at least partially infused into the matrix formed by said first component and forming means to substantially reduce the conductivity of said ion exchange product.

4,324,637
PYROLYSIS PROCESS WITH FEED PRETREATMENT UTILIZING A BENEFICIALLY REACTIVE GAS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,538
Int. Cl.[3] C10C *1/00;* C10B *43/00*
U.S. Cl. 208—8 LE 20 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) contacting a solid particulate carbonaceous feed material in a pretreatment zone with a predetermined amount of a capping agent which is a liquid or solid at ambient temperature, at an elevated temperature sufficient to maintain said capping agent in the liquid or vaporous state and under first conditions of time and elevated temperature sufficient to allow said solid particulate carbonaceous feed material to sorb at least a portion of said capping agent, thereby forming a premixture of said capping agent and said solid particulate carbonaceous feed material containing said sorbed capping agent;

(b) removing said premixture from said pretreatment zone, introducing said premixture, a carbon containing particulate solid source of heat which has been heated to a high temperature, and a beneficially reactive gas into a pyrolysis zone, and pyrolyzing said premixture under turbulent flow conditions in said pyrolysis zone under second predetermined conditions of time and elevated temperature sufficient to produce therefrom a pyrolysis product comprising particulate solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbon vapors in said pyrolytic product vapors containing four or more carbon atoms, said predetermined amount of capping agent and said second predetermined conditions also being operative for stabilizing said newly formed volatilized hydrocarbon free radicals, and substantially simultaneously stabilizing in said pyrolysis zone at least a major portion of said newly formed volatilized hydrocarbon free radicals to produce stabilized newly formed volatilized hydrocarbons, said particulate solids comprising a char product produced from said solid particulate carbonaceous feed material and said carbon containing particulate solid source of heat, said beneficially reactive gas reducing the polymerizing or cracking of said pyrolytic product vapors by inhibiting the reactivity of said char product and said carbon containing particulate solid source of heat, said high temperature being higher than said elevated temperature of said second conditions;

(c) separating said particulate solids from a gaseous mixture which comprises said pyrolytic vapors, said beneficially reactive gas, and any other gases which are mixed therewith to form a substantially solids-free gaseous mixture stream;

(d) contacting said substantially solids-free gaseous mixture stream with a quench fluid and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and a condensed stabilized hydrocarbon stream, said condensed stabilized hydrocarbon stream being formed from at least a major portion of said stabilized newly formed volatilized hydrocarbons; and

(e) separating at least a portion of said condensed stabilized hydrocarbon stream thusly formed from said gaseous residue.

4,324,638
PYROLYSIS PROCESS FOR STABILIZING VOLATILE HYDROCARBONS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,549
Int. Cl.[3] C10R *1/00;* C10B *43/00*
U.S. Cl. 208—8 LE 17 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) pyrolyzing in a pyrolysis zone a solid particulate carbonaceous feed material in the presence of a capping agent under predetermined conditions of time, elevated temperature, and amount of capping agent sufficient to produce therefrom a pyrolysis product comprising particulate product solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbons vapors in said pyrolytic product vapors containing four or more carbon atoms, said capping agent and said predetermined conditions also being operative for stabilizing said newly formed volatilized hydrocarbon free radicals, and substantially simultaneously stabilizing at least a major portion of said newly formed volatilized hydrocarbon free radicals to produce stabilized newly formed volatilized hydrocarbons, said capping agent being a liquid or a solid at ambient temperature;

(b) separating solids which comprise said particulate product solids from a gaseous mixture which comprises said pyrolytic product vapors to form a substantially solids-free gaseous mixture stream;

(c) contacting said substantially solids-free gaseous mixture stream with a quench fluid and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and a condensed stabilized hydrocarbon stream, said condensed stabilized hydrocarbon stream being formed from at least a major portion of said stabilized newly formed volatilized hydrocarbons; and

(d) separating at least a portion of said condensed stabilized hydrocarbon stream thusly formed from said gaseous residue.

4,324,639

PYROLYSIS PROCESS WITH FEED PRETREATMENT

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,550
Int. Cl.[3] C10C *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 21 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) contacting a solid particulate carbonaceous feed material in a pretreatment zone with a predetermined amount of a capping agent which is a liquid or solid at ambient temperature, at an elevated temperature sufficient to maintain said capping agent in the liquid or vaporous state and under first conditions of time and elevated temperature sufficient to allow said solid particulate carbonaceous feed material to sorb at least a portion of said capping agent, thereby forming a premixture of said capping agent and said solid particulate carbonaceous feed material containing said sorbed capping agent;

(b) removing said premixture from said pretreatment zone and pyrolyzing said premixture in a pyrolysis zone under second predetermined conditions of time and elevated temperature sufficient to produce therefrom a pyrolysis product comprising particulate product solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbon vapors is said pyrolytic product vapors containing four or more carbon atoms, said predetermined amount of capping agent and said second predetermined conditions also being operative for stabilizing said newly formed volatilized hydrocarbon free radicals, and substantially simultaneously stabilizing in said pyrolysis zone at least a major portion of said newly formed volatilized hydrocarbon free radicals to produce stabilized newly formed volatilized hydrocarbons;

(c) separating solids which comprise said particulate product solids from a gaseous mixture which comprises said pyrolytic product vapors to form a substantially solids-free gaseous mixture stream;

(d) contacting said substantially solids-free gaseous mixture stream with a quench fluid and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and a condensed stabilized hydrocarbon stream, said condensed stabilized hydrocarbon stream being formed from at least a major portion of said stabilized newly formed volatilized hydrocarbons; and

(e) separating at least a portion of said condensed stabilized hydrocarbon stream thusly formed from said gaseous residue.

4,324,640

PYROLYSIS PROCESS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,595
Int. Cl.[3] C10C *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 20 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) contacting a solid particulate carbonaceous feed material in a pretreatment zone with a predetermined amount of a first capping agent under conditions of time and elevated temperature sufficient to sorb said first capping agent on or in said solid particulate carbonaceous feed material thereby forming a premixture comprising said solid particulate carbonaceous feed material containing sorbed first capping agent, wherein said first conditions will maintain said first capping agent in a liquid or gaseous state, and wherein said first capping agent is a liquid or solid at ambient conditions;

(b) rapidly heating said premixture from said pretreatment zone in the presence of a predetermined amount of a second capping agent in a pyrolysis zone to pyrolyze said solid particulate carbonaceous feed material of said premixture and to produce from said solid particulate carbonaceous feed material a char product and pyrolytic product vapors which comprise newly formed volatilized hydrocarbon free radicals and substantially simultaneously stabilizing at least a major portion of said volatilized hydrocarbon free radicals by reaction with said sorbed first capping agent and said second capping agent to form stabilized volatilized hydrocarbons;

(c) removing from said pyrolysis zone a gas-solid mixture which comprises gases which comprise said stabilized volatilized hydrocarbons and solids which are entrained in said gases and comprise said char product, and separating at least a major portion of said solids in said gas-solid mixture from said gases in a separation zone;

(d) cooling said gases separated from said solids in said separation zone by contacting said gases with a quench fluid in a quench zone to form condensed stabilized hydrocarbons which are formed from at least a major portion of said stabilized volatilized hydrocarbons; and

(e) recovering at least a portion of said condensed stabilized hydrocarbons.

4,324,641

PYROLYSIS PROCESS UTILIZING A BENEFICIALLY REACTIVE GAS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,596
Int. Cl.[3] C10C *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 20 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) contacting a solid particulate carbonaceous feed material in a pretreatment zone with a predetermined amount of a first capping agent under first conditions of time and elevated temperature sufficient to sorb said first capping agent on or in said solid particulate carbonaceous feed material thereby forming a premixture comprising said solid particulate carbonaceous feed material containing sorbed first capping agent, wherein said first conditions will maintain said first capping agent in a liquid or gaseous state, and wherein said first capping agent is a liquid or solid at ambient conditions;

(b) removing said premixture from said pretreatment zone, introducing said premixture, a predetermined amount of a second capping agent, a carbon containing particulate solid source of heat which has been heated to a high temperature, and a beneficially reactive gas into a pyrolysis zone and rapidly heating and pyrolyzing said solid particulate carbonaceous feed material of said premixture in said pyrolysis zone under turbulent flow conditions and under second conditions of time and elevated temperature sufficient to produce from said solid particulate carbonaceous feed material of said premixture a char product and pyrolytic product vapors which comprise newly formed volatilized hydrocarbon free radicals and substantially simultaneously stabilizing at least a major portion of said volatilized hydrocarbon free radicals by reaction with said sorbed first capping agent and said second capping agent to form stabilized volatilized hydrocarbons, said beneficially reactive gas reducing the polymerizing or cracking of said pyrolytic product vapors by inhibiting the reactivity of said char product and said carbon containing particulate solid source of heat, said high temperature being higher than said elevated temperature of said second conditions;

(c) removing from said pyrolysis zone a gas-solid mixture which comprises gases which comprise said stabilized volatilized hydrocarbons and solids which are entrained in said gases and comprise said char product, and separating at least a major portion of said solids in said gas-solid mixture from said gases in a separation zone;

(d) cooling said gases separated from said solids in said separation zone by contacting said gases with a quench fluid in a quench zone to form condensed stabilized hydrocarbons which were formed from at least a major portion of said stabilized volatilized hydrocarbons; and

(e) recovering at least a portion of said condensed stabilized hydrocarbons.

4,324,642

PYROLYSIS PROCESS FOR PRODUCING CONDENSED STABILIZED HYDROCARBONS UTILIZING A BENEFICIALLY REACTIVE GAS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,597
Int. Cl.[3] C10C *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 17 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) pyrolyzing a solid particulate carbonaceous feed material at a pyrolysis temperature by introducing said solid particulate carbonaceous feed material, a carbon containing particulate solid source of heat which has been heated to a temperature higher than said pyrolysis temperature, and a beneficially reactive gas into a pyrolysis zone, under turbulent flow conditions, and under conditions of time and elevated temperature sufficient to produce therefrom a pyrolysis product comprising particulate solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbon vapors in said pyrolytic product vapors containing four or more carbon atoms, said particulate solids comprising a char product produced from said solid particulate carbonaceous feed material and said carbon containing particulate solid source of heat, said beneficially reactive gas reducing the polymerizing or cracking of said pyrolytic product vapors by inhibiting the reactivity of said char product and said carbon containing particulate solid source of heat;

(b) separating said particulate solids from a gaseous mixture which comprises said pyrolytic product vapors, said beneficially reactive gas, and any other gases which are mixed therewith to form a substantially solids-free gaseous mixture stream;

(c) contacting said substantially solids-free gaseous mixture stream with a quench fluid comprising a capping agent suitable for stabilizing said newly formed volatilized hydrocarbon free radicals, under predetermined conditions of temperature and flow rate of capping agent sufficient for substantially simultaneously stabilizing substantially all of said newly formed volatilized hydrocarbon free radicals by termination, and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and condensed stabilized hydrocarbons; and

(d) separating at least a portion of said condensed stabilized hydrocarbons thusly formed from said gaseous residue.

4,324,643

PYROLYSIS PROCESS FOR PRODUCING CONDENSED STABILIZED HYDROCARBONS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,598
Int. Cl.[3] C10C *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 14 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) pyrolyzing a solid particulate carbonaceous feed material under conditions of time and elevated temperature sufficient to produce therefrom a gas-solids mixture which is a pyrolysis product comprising particulate product solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbon vapors in said pyrolytic product vapors containing four or more carbon atoms;

(b) separating solids which comprise said particulate product solids from a gaseous mixture which comprises said pyrolytic product vapor to form a substantially solids-free gaseous mixture stream;

(c) contacting said substantially solids-free gaseous mixture stream with a quench fluid comprising a capping agent suitable for stabilizing said newly formed volatilized hydrocarbon free radicals, under predetermined conditions of temperature and flow rate of capping agent sufficient for substantially simultaneously stabilizing substantially all of said newly formed volatilized hydrocarbon free radicals by termination, and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and condensed stabilized hydrocarbons; and

(d) separating at least a portion of said condensed stabilized hydrocarbons thusly formed from said gaseous residue.

4,324,644

PYROLYSIS PROCESS FOR STABILIZING VOLATILE HYDROCARBONS UTILIZING A BENEFICIALLY REACTIVE GAS

Kandaswamy Durai-Swamy, Culver City, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 26, 1980, Ser. No. 181,599
Int. Cl.[3] C10G *1/00*; C10B *43/00*
U.S. Cl. 208—8 LE 17 Claims

1. A process for producing condensed stabilized hydrocarbons from a solid particulate carbonaceous material comprising:

(a) pyrolyzing in a pyrolysis zone, under turbulent flow conditions a solid particulate carbonaceous feed material, in the presence of a capping agent which is a liquid or a solid at ambient temperature, at a pyrolysis temperature by introducing said solid particulate carbonaceous feed material, a carbon containing particulate solid source of heat which has been heated to a temperature higher than said pyrolysis temperature, and a beneficially reactive gas into a pyrolysis zone under predetermined conditions of time, elevated temperature, and amount of capping agent sufficient to produce therefrom a pyrolysis product comprising particulate solids and pyrolytic product vapors which comprise hydrocarbons which comprise newly formed volatilized hydrocarbon free radicals, a portion of said hydrocarbons containing larger hydrocarbons, said larger hydrocarbons being all the hydrocarbon vapors in said pyrolytic product vapors containing four or more carbon atoms, said capping agent and said predetermined conditions also being operative for stabilizing said newly formed volatilized hydrocarbon free radicals, and substantially simultaneously stabilizing at least a major portion of said newly formed volatilized hydrocarbon free radicals

to produce stabilized newly formed volatilized hydrocarbons, said particulate solids comprising a char product produced from said solid particulate feed carbonaceous material, and said carbon containing particulate solid source of heat, said beneficially reactive gas reducing the polymerizing or cracking of said pyrolytic product vapors by inhibiting the reactivity of said char product and said carbon containing particulate solid source of heat;

(b) separating said particulate solids from a gaseous mixture which comprises said pyrolytic product vapors, said beneficially reactive gas, and any other gases which are mixed therewith to form a substantially solids-free gaseous mixture stream;

(c) contacting said substantially solids-free gaseous mixture stream with a quench fluid and substantially simultaneously condensing at least a major portion of said larger hydrocarbons, thereby forming a gaseous residue and a condensed stabilized hydrocarbon stream, said condensed stabilized hydrocarbon stream being formed from at least a major portion of said stabilized newly formed volatilized hydrocarbons; and

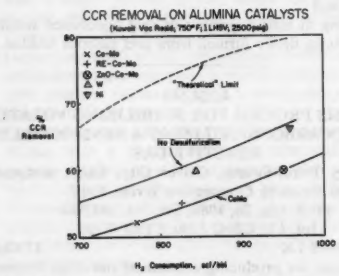
(d) separating at least a portion of said condensed stabilized hydrocarbon stream thusly formed from said gaseous residue.

4,324,645

UPGRADING RESIDUAL OIL

Philip J. Angevine, W. Deptford, and Thomas R. Stein, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1980, Ser. No. 147,033
Int. Cl.³ C10G *45/00*; B01J *23/16*
U.S. Cl. 208—50 **13 Claims**



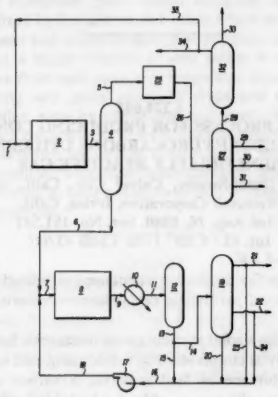
1. A process of upgrading a hydrocarbon oil fraction which comprises contacting a hydrocarbon oil fraction with hydrogen and a catalyst at conversion conditions including a temperature of from about 650° F. to about 850° F., a pressure of from about 1000 psig to about 3000 psig, a liquid hourly space velocity of from about 0.5 to about 4 and a hydrogen circulation rate of from about 1000 scf/bbl to about 20,000 scf/bbl, said catalyst comprising a porous inorganic refractory support having greater than about 50% of its pore volume contribution in pores having diameters of from about 100 to about 200 Angstroms and at least about 30% of its pore volume contribution in pores having diameters of from about 0 to about 50 Angstroms, said support having deposited thereon a metal or combination of metals, oxides, sulfides or oxysulfides thereof, said metal or combination of metals being selected from the group consisting of molybdenum, tungsten, iron, cobalt, nickel, palladium, molybdenum-tungsten, molybdenum-iron, molybdenum-palladium, tungsten-iron, tungsten-cobalt, tungsten-palladium, iron-cobalt, iron-nickel, iron-palladium, cobalt-nickel, cobalt-palladium and nickel-palladium, whereby the Conradson Carbon Residue of said fraction is selectively reduced.

4,324,646

PROCESS FOR CONVERTING C_4 OLEFINIC CRACKING CUTS TO ALKYLATE AND GASOLINE

Jean-Francois Le Page, Rueil-Malmaison; Jean Cosyns, Maule; Jean Miquel, Paris, and Bernard Juguin, Rueil-Malmaison, all of France, assignors to Institute Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 25,360, Mar. 30, 1979, Pat. No. 4,244,806. This application Aug. 21, 1980, Ser. No. 180,205
Claims priority, application France, Mar. 31, 1978, 78 09639
The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.
Int. Cl.³ C10G *69/12*
U.S. Cl. 208—71 **6 Claims**



1. A process for selectively polymerizing isobutene in an olefinic C_4 cut comprising isobutene and normal butenes, said process comprising the step of contacting the olefinic C_4 cut with a catalyst consisting essentially of silica-alumina; whereby at least 90% of the isobutene and less than 10% of the normal butenes in the cut are converted.

4,324,647

CATALYTIC HYDROCRACKING, HYDRODESULFURIZATION, AND/OR HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE AND A ZEOLITE AS THE CATALYTIC AGENT

Lloyd E. Gardner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1980, Ser. No. 145,639
Int. Cl.³ C10G *47/20*
U.S. Cl. 208—111 **16 Claims**

1. A process for the catalytic hydrocracking of a feedstock which contains at least one hydrocrackable organic compound comprising the step of contacting said feedstock under suitable hydrocracking conditions with a catalyst composition comprising zeolite, zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof.

4,324,648

CRACKING CATALYST POISONS PASSIVATED WITH TIN COMPOUNDS PLUS BOTH SULFUR AND PHOSPHORUS

John S. Roberts; Brent J. Bertus; Dwight L. McKay, and H. Wayne Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 24, 1980, Ser. No. 132,719
Int. Cl.³ C10G 11/05
U.S. Cl. 208—114 20 Claims

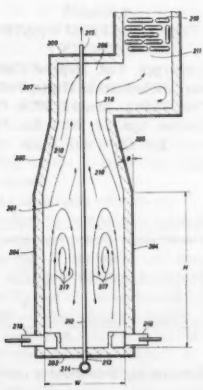
1. In a process comprising:
(a) contacting a hydrocarbon feedstock with a fluidized zeolite-containing cracking catalyst in a cracking zone under cracking conditions in the absence of added hydrogen or antimony to obtain a cracked product;
(b) recovering the cracked product;
(c) passing the cracking catalyst from the cracking zone to a regeneration zone;
(d) regenerating the cracking catalyst in the regeneration zone by contact with oxygen-containing gas under regeneration conditions to produce a regenerated catalyst; and
(e) introducing the regenerated catalyst to the cracking zone for contact with the hydrocarbon feedstock;
wherein the regenerated catalyst contains contaminants selected from the group consisting of nickel, vanadium and iron deposited on said cracking catalyst in such a way that said cracking catalyst cannot be fully regenerated in the regeneration zone, the improvement comprising contacting the cracking catalyst with a treating agent containing tin, phosphorus and sulfur in an amount sufficient to impart to said cracking catalyst a tin concentration of from about 0.0001 to about 4 percent by weight of contacted cracking catalyst wherein the cracking catalyst is contacted with from about one-half to about 8 parts by weight of sulfur and/or from about one quarter to about one part by weight of phosphorus for each part by weight of tin with which it has been contacted.

4,324,649

FIRED PROCESS HEATER

William D. Parizot; Paul D. O'Lenick, both of Katy, and Lowell D. Fraley, Sugarland, all of Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jul. 8, 1980, Ser. No. 166,880
Int. Cl.³ C10G 9/20
U.S. Cl. 208—130 6 Claims



1. In a process for heating hydrocarbons by indirect heat exchange with combustion gas in a fired, tubular heater having a radiant chamber and a plurality of straight, vertical, tubular heat exchange means disposed therein, each of the means having a single pass in heat exchange relationship with the combustion gas and the hydrocarbon passing upwardly through the single pass, the improvement which comprises passing combustion gas in a predominantly back-mixed flow condition over lower portions of the tubular heat exchange means within the radiant chamber and then passing the combustion gas in a predominantly plug-flow condition over upper portions of the tubular heat exchange means within the radiant chamber.

4,324,650

CATALYTIC COMPOSITE AND PROCESS FOR USE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 111,752, Jan. 14, 1980, Pat. No. 4,290,916, which is a continuation-in-part of Ser. No. 80,638, Oct. 1, 1979, Pat. No. 4,276,194. This application Nov. 24, 1980, Ser. No. 209,553
Int. Cl.³ C10G 27/06
U.S. Cl. 208—206 13 Claims

1. A method of treating a mercaptan-containing sour petroleum distillate by contacting said distillate at oxidation conditions with a catalytic composite prepared by contacting a molecular sieve support with a substituted ammonium compound represented by the structural formula:

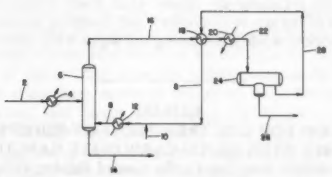
wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide, drying the resulting composite, thereafter contacting the resulting composite with a metal chelate and with an alkali metal hydroxide, said alkali metal hydroxide being in a weight ratio with said molecular sieve support from about 0.1:1 to about 1:1, and thereafter drying the resulting catalytic composite.

4,324,651

DEASPHALTING PROCESS

Louis D. Rollmann, Princeton, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,602
Int. Cl.³ C10C 3/00; C10G 21/16
U.S. Cl. 208—309 11 Claims



1. A process for deasphalting an asphalt-containing mineral oil which comprises:
(a) contacting an asphalt-containing mineral oil at an elevated pressure and a temperature greater than about 80° C. with an amount of methanol effective to form two liquid phases, a deasphalted oil phase comprising a major amount of the methanol and an asphalt phase comprising a minor amount of the methanol, said pressure and said

temperature being effective to maintain the methanol in the liquid phase,

(b) separating the two phases, and

(c) maintaining the deasphalted oil phase at a pressure and a temperature less than about 80° C. for a period of time sufficient to form two liquid phases, a methanol phase and a second deasphalted oil phase comprising a minor amount of methanol, said pressure and said temperature being effective to maintain the methanol in the liquid phase.

4,324,652

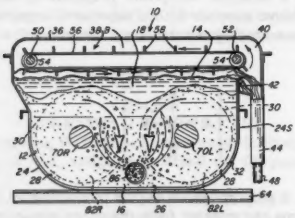
FLOTATION METHOD AND APPARATUS FOR RECOVERING CRUDE OIL FROM TAR-SAND

Albert G. Hack, Denver, Colo., assignor to Crescent Engineering Company, Denver, Colo.

Division of Ser. No. 38,398, May 14, 1979. This application Oct. 9, 1980, Ser. No. 195,596

Int. Cl.³ B03B 5/52

U.S. Cl. 209—3 **4 Claims**



1. The method for removing water-immiscible bitumens and the like from the surface of tar-sands and separating same from the sand grains which includes the steps of: providing a vessel, introducing coated sand in the form of an aqueous slurry into the vessel, rubbing the coated sand grains together under water by tumbling them in a generally downward direction between two counterrotating screw conveyors to rub the grains together and scrub water immiscible materials from the surface thereof, bubbling an air-water mixture up through the descending sand grains at a rate and in a quantity effective to lift the immiscibles free of the sand and deposit same on the surface of the water without inducing undue turbulence of a degree which would result in sand particles being elevated to the surface of the water bath where the freed immiscibles are located so that said washed sand does not contact said surface-located freed immiscibles while simultaneously washing the sand with said water so that said water and air bubbles are directed upwardly through said slurry simultaneously with said rubbing effected by said screw conveyors, skimming the immiscibles thus deposited off the surface of the water while moving the progressively cleaner sand grains toward one end by means of the screw conveyors, and dumping the clean sand out the bottom while maintaining the water level above that of the sand.

4,324,653

PROCESS FOR THE TREATMENT OF PHOSPHATE ORES WITH SILICO-CARBONATE GANGUE

Amar Henchiri; Jean-Luc Cecile; Gerard Baudet; Gilles Barbery, all of Orleans, and Rene Bloise, Saint Denis en Val, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Nov. 26, 1980, Ser. No. 210,757

Claims priority, application France, Dec. 17, 1979, 79 30868

Int. Cl.³ B03D 1/06

U.S. Cl. 209—167 **9 Claims**

1. A process for the treatment by flotation of phosphate ores with silico-carbonate gangue, comprising the steps of:

(1) overall flotation of the ore with a collector comprising essentially phosphoric ester in an amount and under conditions capable of causing the silicate compounds to pass into the flotation residue, said flotation step being effected at the natural pH of the ore pulp, and recovering a float product containing the phosphate and carbonate compounds,

(2) conditioning the float product in an acid medium free of phosphoric acid for a time sufficient to effect the flotation of carbonates, while the phosphates, which are the valuable product desired, remain in the residue.

4,324,654

RECOVERY OF COPPER FROM COPPER OXIDE MINERALS

William T. Rule, Hibbing, Minn., assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Oct. 12, 1978, Ser. No. 950,859

Int. Cl.³ B03D 1/02

U.S. Cl. 209—166 **6 Claims**

1. A method of recovering copper from ores containing copper as atacamite/paratacamite by flotation which comprises

(a) preparing a slurry of the ore in water,

(b) adjusting the pH of the slurry to the desired value,

(c) adding to the slurry a first chelating agent having the formula

$$R—C(OH)=N—OR^1 \qquad \text{(Formula I)}$$

and a second chelating agent having the formula

$$R^2OCSSX \qquad \text{(Formula II)}$$

wherein

R is an aliphatic or aromatic group containing from 5 to 10 carbon atoms,

R^1 is hydrogen or an alkali metal,

R^2 is an alkyl group containing up to 10 carbon atoms, and

X is an alkali metal,

(d) adding a frothing agent to the slurry,

(e) agitating the slurry to form a froth containing the floated copper,

(f) removing the froth, and

(g) recovering the floated copper from the froth.

4,324,655

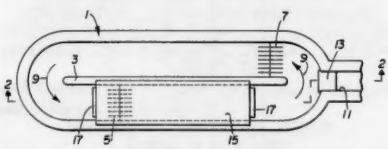
APPARATUS FOR TREATING WASTEWATER WITH OXYGEN

Josef Muskat, Aarbergen, Fed. Rep. of Germany, assignor to Passavant-Werke Michelbacher Hutte, Fed. Rep. of Germany

Division of Ser. No. 47,062, Jun. 11, 1979, Pat. No. 4,285,818. This application Apr. 24, 1980, Ser. No. 143,268

Int. Cl.³ C02F 3/26

U.S. Cl. 210—96.1 **20 Claims**



1. Apparatus for treating wastewater comprising:

(a) a basin,

(b) means continuously circulating said wastewater within said basin on an endless horizontal course,

(c) controllable means for introducing gas containing oxygen at a concentration exceeding that of air into the wastewater by agitating the surface of said wastewater,

(d) a cover closing an area of said endless horizontal course

to the atmosphere and defining a compartment underneath said cover which is filled by said gas with the remainder of the course being exposed to the atmosphere,

(e) said controllable means for introducing said gas by agitating the surface of said wastewater being arranged underneath said cover, and

(f) means for adjustably withdrawing gas from beneath said cover.

4,324,656

INSTALLATION FOR THE WITHDRAWAL AND PURIFICATION TREATMENT OF WATERS AND AQUEOUS EFFLUENTS

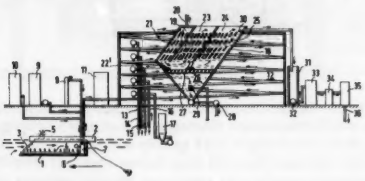
Serge E. Godar, Avenue des Croix de Guerre, 330, 1120 Bruxelles, Belgium

Filed Oct. 11, 1979, Ser. No. 84,032

Claims priority, application Belgium, Oct. 24, 1978, 46 646

Int. Cl.³ C02F *1/74, 1/52*

U.S. Cl. 210—170 **9 Claims**



1. In an installation for withdrawal and purification treatment of liquid comprising water and aqueous effluents, respectively, comprising two essential elements, namely a water intake apparatus defining an intake and including means for pretreatments of the liquid to take place in said intake apparatus, and a purification apparatus including means for controlling the purification apparatus by the intake apparatus and for further treatments of the liquid to take place in the purification apparatus, the purification apparatus having a settling unit for settling out heavy matter, the improvement comprising

a single pump means for transferring the water and aqueous effluents, respectively, to be treated from the intake all the way up to the settling,

a continuous tubular reactor, extending from the intake apparatus to the purification apparatus, of tubular form and length and operatively connected with said pump means, the latter for forcing the liquid through said continuous tubular reactor,

said pump means for providing a rate of flow which conditions all of the pretreatments in the water intake apparatus and all of the treatments in the purification apparatus and being such that the linear velocity of liquid plus any particles circulating in the tubular reactor is between 0.40 m/sec and 1 m/sec,

said water intake apparatus comprises,

a receptacle adapted to be partially immersed,

floats support said receptacle such that the receptacle is partially immersed in the water and aqueous effluents,

said receptacle is formed with a hydrodynamically shaped front and rear formed by an inclined grid constituting said intake through which the liquid flows,

said receptacle having an interior portion located in front of said grid downstream with respect to the flow of the water and the aqueous effluents, respectively, to be treated, said interior portion forms an aeration compartment constituting means for aerating the water and aqueous effluents and liberating air bubbles, said aerating means comprises a plurality of porous members,

said aeration compartment has an upper open edge extending above the surface of the water and aqueous effluents, the degree of immersion of said receptacle by means of said floats being such that said open edge of said aeration compartment does not permit entry of water that has not passed through said grid.

4,324,657

APPARATUS FOR THE TREATMENT OF LIQUIDS

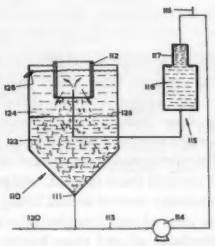
Michael E. Garrett, 92 York Rd., Woking, Surrey, England

Filed Feb. 2, 1978, Ser. No. 874,700

Claims priority, application United Kingdom, Feb. 4, 1977, 4699/77; Feb. 16, 1977, 6490/77; Mar. 17, 1977, 11365/77; Sep. 12, 1977, 37978/77

Int. Cl.³ C02F *3/22*

U.S. Cl. 210—197 **2 Claims**



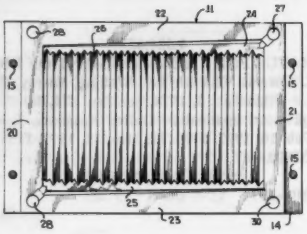
1. Apparatus for treating aqueous waste material having a biochemical oxygen demand, comprising a vessel for containing a volume of the material; means for continuously feeding a stream of aqueous waste material through a conduit in communication with means for defining a confined stilling zone positioned in an upper portion of the vessel; means for feeding a second stream of aqueous liquor containing bacterial sludge into said conduit to combine the streams; baffle means defining said stilling zone for keeping the combined streams separate from an upper layer of clarified liquor to be separately maintained in the upper portion of the vessel; means for withdrawing clarified liquor maintained in the upper layer of the vessel; means for combining the streams and introducing the streams into the stilling zone wherein the momentum of the liquid is substantially reduced before the liquid passes to a lower zone of the vessel wherein biological treatment of the aqueous material and collection of bacterial sludge takes place; means for introducing oxygen or oxygen-containing gas mixture into the combined streams to form discrete bubbles of oxygen gas therein and thereby facilitate dissolution of the oxygen; said means for feeding a second stream comprising means for recycling aqueous material containing bacterial sludge to the upper region of said stilling zone by withdrawing aqueous waste material containing bacterial sludge to be collected in the lower zone, said means for feeding the stream of aqueous material through the conduit and to recycle the bacterial sludge comprising pump means, an oxygen injection conduit in communication with the conduit adjacent the pump means, a partition across the stilling zone dividing it into separate upper and lower regions, said means for recycling comprising a conduit for feeding aqueous material into the upper region of the stilling zone; a passage through the partition, the passage being wider at its outlet than its inlet thereby constituting the expansion chamber, means for creating a flow, initially turbulent, of aqueous material from the upper region of the stilling zone through the passage and into the lower region of the stilling zone, and means for introducing oxygen or oxygen-containing gas mixture into the turbulent flow.

4,324,658

TRANSFER DEVICE HAVING A THIN WALL PLATE

William G. Esmond, 800 Country Club Rd., Havre de Grace, Md. 21078

Filed Jun. 10, 1977, Ser. No. 805,394
Int. Cl.³ B01D 31/00
U.S. Cl. 210—321.3 17 Claims



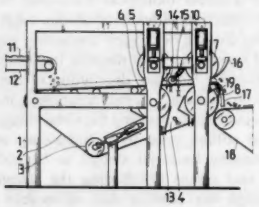
1. A transfer plate for a dialyzer and like transfer device, said transfer plate being formed from sheet material shaped to define adjacent to two opposite edges thereof and on both faces thereof fluid flow troughs, said transfer plate further having a central portion disposed between said troughs formed to define a generally corrugated arrangement defining adjacent fluid flow passages on both faces thereof, said passages extending between and generally normal to and being in communication with respective ones of said troughs, adjacent ones of said troughs on opposite faces of said plate having cross sections which overlap when viewed from said edge of said transfer plate, said transfer plate having a substantially uniform material thickness throughout.

4,324,659

LIME SLUDGE PRESS UNIT

Juha Titoff, Savonlinna, Finland, assignor to Enso-Gutzeit Osakehitö , Helsinki, Finland

Filed Nov. 10, 1980, Ser. No. 205,273
Claims priority, application Finland, Nov. 13, 1979, 793549
Int. Cl.³ B01D 33/04
U.S. Cl. 210—386 6 Claims



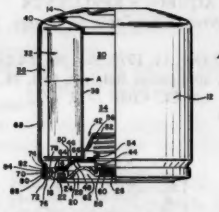
1. Improvement in a lime sludge press unit comprising at least two pairs of press rolls, the lime sludge web passing, supported by an endless wire, through their press nips and moisture escaping from the lime sludge therein, wherein the improvement comprises that after the first pair of rolls is located a lime sludge treatment screw transversal to the lime sludge web and which breaks up the pressed lime sludge web and carrying helical threads starting at its ends and opposite in direction so that these both transport the lime sludge from the margin of the web towards its center.

4,324,660

FLUID FILTER

Richard H. Peyton, Berkley, Mass., and Donald I. Thornton, Warwick, R.I., assignors to Fram Corporation, East Providence, R.I.

Filed Aug. 25, 1980, Ser. No. 180,734
Int. Cl.³ B01D 27/08
U.S. Cl. 210—440 8 Claims



1. In an automotive oil filter, a housing defining a chamber therein, said housing including a cup-shaped member having a circumferentially-extending wall defining an axis and an open end and a closure member closing said open end, an annular fluid-permeable filtering element within said housing chamber, said filtering element dividing said chamber into a pair of compartments, said closure member including a threaded opening communicating with one of said compartments, another opening in said closure member communicating with the other of said compartments, an annular seal mounted on said closure member wherein the improvement comprises:

said open end of said cup-shaped member is defined by a circumferentially-extending marginal edge, said closure member being a stamping consisting of a single member having a circumferentially-extending marginal edge;

the marginal edges of said cup-shaped member and of said closure member having cooperating means for forming a fluid-tight seal between the closure member and the cup-shaped member;

said cooperating means including a bead circumscribing the marginal edge of said cup-shaped member, and an inner annular flange and an outer annular flange defined by the marginal edge of said closure member;

said inner flange formed of a double thickness fold of said closure member projecting perpendicularly to the plane of said closure member and extending into said housing chamber;

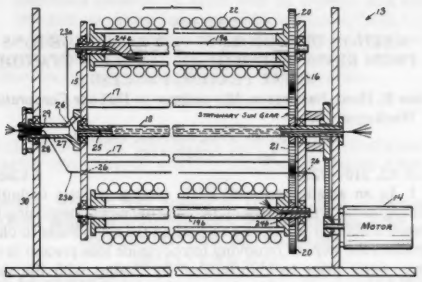
said outer flange formed of a single upwardly bent thickness of said closure member, located radially outward of said first flange, projecting perpendicular to the plane of said closure member and extending outside said housing chamber;

wherein the marginal edge of said cup-shaped member is received in a channel formed between said inner and outer flanges; said outer flange includes a section projecting radially inwardly toward the wall of said cup-shaped member; and said fluid-tight seal is formed by crimping said bead between said inner and outer flanges and further crimping the bead between said inwardly projecting section and the floor of said channel.

4,324,661
APPARATUS AND METHOD FOR CONTINUOUS COUNTERCURRENT EXTRACTION AND PARTICLE SEPARATION

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,491
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—635 **2 Claims**

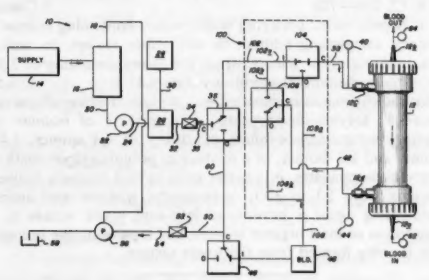


1. A method of centrifugal continuous countercurrent chromatographic extraction of separable components from a liquid sample comprising first eluting two respective solvent phases of different viscosity and density through opposite ends of an axially rotating column, revolving the column simultaneously around an axis spaced from and parallel to the axis of rotation of the column at the same angular velocity and in the same angular direction, then, after a steady hydrodynamic equilibrium is substantially reached, introducing the liquid sample at a middle portion of the column, and then collecting a selected separable component of the sample from one end of the column.

4,324,662
FLOW REVERSAL IN A DIALYZER

William J. Schnell, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 28, 1979, Ser. No. 108,119
Int. Cl.³ B01D *13/00, 31/00*
U.S. Cl. 210—646 **13 Claims**



9. A method for operating:
an artificial kidney system which includes a negative-pressure-type dialyzer having spaced blood inlet and outlet ports, spaced first and second dialysis solution ports which are constructed to be positioned one above the other, and a semipermeable membrane that separates dialysis solution and blood flowing through said dialyzer and defines separate flow paths; and a dialysis machine coupled to said dialyzer and having negative pressure pump means for drawing dialysis solution through the dialyzer and having valve means for selectively controlling the direction of flow of dialysis solution through said dialyzer, said method comprising the steps of:

(a) orienting said dialyzer at an attitude in which the blood inlet port is positioned below the blood outlet port and one of said first and second dialysis solution ports is positioned above the other;

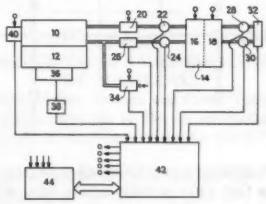
(b) priming the dialysis solution side of the dialyzer by operating the valving system to cause dialysis solution to flow under a negative pressure into the lower dialysis solution port, upwardly through the dialyzer and out from the upper dialysis solution port, so as to expel air from the dialysis solution flow path; and thereafter

(c) operating the valving system so as to reverse the direction of dialysis solution flow to a normal flow direction wherein dialysis solution enters said upper port, flows downwardly through the dialyzer and exits the lower port.

4,324,663
METHOD AND APPARATUS FOR REGULATING HAEMODIALYSIS CONDITIONS

Jean C. Hirel, Villebon-sur-Yvette; Francois M. Goupy, Paris; Pierre G. Bloch, Sceaux, and Patrice E. Degoulet, Paris, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed Aug. 1, 1977, Ser. No. 820,642
Claims priority, application France, Jul. 30, 1976, 76 23423
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—646 **12 Claims**



1. A method of regulating haemodialysis conditions while simultaneously subjecting a patient to ultrafiltration of the blood, which method comprises:
circulating the blood of the patient to and from one side of a membrane of a haemodialyser,
circulating a haemodialysis solution to and from the other side of the said membrane of the haemodialyser,
supplying physiologically acceptable fluid to the patient by perfusion,
monitoring variations in the weight of the patient during the haemodialysis,
determining a validity zone defined by two weight/time curves defining at any given moment an area of weight values,
comparing variations in weight with said area at any one moment, for generating a control signal, and
controlling at least a parameter determining the course of ultrafiltration according to said control signal.

6. A haemodialysis apparatus for effecting dialysis of the blood by ultrafiltration, comprising:
a haemodialyser having membrane means separating a blood compartment for a dialysis solution compartment,
means for causing the circulation of the blood of a patient and a haemodialysis solution on either side of said membrane,
a perfusion arrangement for a patient whose blood is to undergo haemodialysis,
at least one sensor of a parameter related to the weight of a

patient for providing a signal representing variations in the weight of the patient,

means for comparing the signal of variations in weight with an area of weight values defined by plotting maximum and minimum acceptable weights of the patient at each time within a haemodialysis period during which the haemodialyser is to be employed, to give a control signal when the signal of weight variation is not within said area, and

means for controlling at least a parameter determining the course of ultrafiltration according to said control signal.

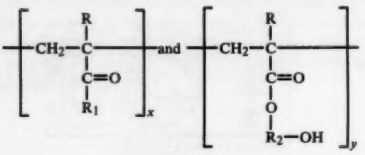
4,324,664

METHOD AND COMPOSITION FOR TREATING AQUEOUS MEDIUMS

William R. Snyder, Warminster, and Diane Feuerstein, Bensalem, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 16, 1981, Ser. No. 254,842
Int. Cl.³ C02F 5/12
U.S. Cl. 210—701 10 Claims

1. In a method of controlling the deposition of scale imparting precipitates on the structural parts of the system exposed to an aqueous medium containing scale imparting precipitates under deposit forming conditions, which method comprises adding to said aqueous medium an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer have the following formula



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM or NH_2 where M is a water soluble cation; R_2 is a lower alkyl of from about 2–6 carbon atoms and a mole ratio of x to y is 34:1 to 1:4, the improvement comprising adding to said aqueous medium an effective amount of a water soluble ester of an aliphatic sulphodicarboxylic acid (II).

4,324,665

PROCESS FOR RECOVERING BROMINE FROM WASTE LIQUID

Isao Yokomichi, Moriyama; Takeo Yamada, Nagoya; Akio Mohri, Yokkaichi; Kiyoshi Ota, Tokyo, and Minoru Ikeda, Onoda, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka and Nissan Chemical Industries, Ltd., Tokyo, both of, Japan

PCT No. PCT/JP79/00239, § 371 Date Nov. 5, 1980, § 102(e) Date Oct. 28, 1980, PCT Pub. No. WO80/01905, PCT Pub. Date Sep. 18, 1980
PCT Filed Sep. 7, 1979, Ser. No. 201,404
Claims priority, application Japan, Mar. 5, 1979, 54-25204
Int. Cl.³ C02F 1/76; C01B 7/09
U.S. Cl. 210—718 5 Claims

1. A process for recovering bromine, from a waste liquid formed in the production of an aniline derivative by ammonolysis of a bromobenzene derivative nuclear substituted with at last one halogen atom or functional group, or from a similar liquid, said process being characterized by containing the following steps:

(a) adding to said liquid an alkaline material in an amount of not less than 1.1 mole-times the combined ammonia content in said liquid;

(b) bringing the resulting liquid into contact with gaseous chlorine until the oxidation-reduction potential of the liquid reaches at least 400 mV;

(c) filtering and removing the formed percipitate;

(d) adding a mineral acid or an acidic waste liquid containing a mineral acid before or after the above-said step (c) to adjust the pH of the liquid to 3 or less; then,

(e) bringing the resulting liquid into contact with gaseous chlorine while allowing the liquid to flow down through a vertically long, gas-liquid contact equipment, and simultaneously introducing steam to distill bromine out.

4,324,666

METHOD OF REMOVING FERROCYANIDE IONS FROM RINSE WATER OF AN ALKALINE CYANIDE METAL PLATING PROCESS

John E. Hunt, Barrington, Ill., assignor to DuTone Corporation, Waukegan, Ill.

Filed Jul. 23, 1980, Ser. No. 171,599
Int. Cl.³ C02F 1/52
U.S. Cl. 210—722 6 Claims

1. In an alkaline cyanide metal plating process including plating metal articles, rinsing the improvement comprising the plated articles in water, and subjecting the rinse water to chlorination, the steps of removing ferrocyanide ions present in the rinse water prior to chloriniation by mixing with the rinse water maintained at pH values ranging from pH 7 to pH 10 at least one equivalent of soluble manganous salt required to react with the ferrocyanide ions present, thereby forming manganous ferrocyanide $[Mn_2Fe(CN)_6]$ as a water insoluble precipitate and removing the precipitate from the treated rinse water.

4,324,667

PROCESS FOR PURIFICATION OF WASTE WATERS FROM AROMATIC AMINES

Igor I. Konstantinov, prospekt Lenina, 101, kv. 12; Antonina I. Kormushechkina, ulitsa Pirogova, 1/2, kv. 26; Jury A. Avdonin, prospekt Tsiolkovskogo, 31, kv. 52; Vladimir M. Kotlyarsky, prospekt Pobedy, 3, kv. 34; Albert A. Kim, ulitsa Griboedova, 33, kv. 22; Nikolai V. Obraztsov, ulitsa Kljukvina, 8, kv. 24, and Alexei V. Efimov, prospekt Lenina, 85, kv. 43, all of Dzerzhinsk, U.S.S.R.

PCT No. PCT/SU79/00010, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO80/01800, PCT Pub. Date Sep. 4, 1980
PCT Filed Feb. 23, 1979, Ser. No. 198,208
Int. Cl.³ C02F 1/54
U.S. Cl. 210—729 3 Claims

1. A process for purifying waste waters containing aromatic amines, comprising adding, to said waste waters, an amine precipitating agent selected from the group consisting of 3,3'-dimethyldiphenylmethanediisocyanate-4,4'; 3.5-dibromotolylenediisocyanate-2,4; diphenylmethanediisocyanate-4,4'; tolylenediisocyanate-2,4; a mixture of isomers of diphenylmethanediisocyanate consisting of 4,4'-isomer, 2,4'-isomer and 2,2'-isomer, or a mixture of polyphenylpolymethylene-polyisocyanates, in a molar ratio to said aromatic amines ranging from 1:1 to 30:1, respectively; wherein said amine precipating agent is introduced into said waste waters as a solution in an inert organic solvent, and separating the precipitate thereby formed from the waste waters.

4,324,668

HIGH VISCOSITY ACIDIC TREATING FLUIDS AND METHODS OF FORMING AND USING THE SAME

Lawrence E. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 2, 1978, Ser. No. 947,327
Int. Cl.³ C09K 3/00
U.S. Cl. 252—8.55 C 24 Claims

1. A method of treating a subterranean well formation comprising the steps of:

combining a hydratable gelling agent having a molecular

weight greater than 100,000 and having carboxyl functionability and capable of being crosslinked with metal ions and selected from the group consisting of carboxymethylhydroxyethyl cellulose having a DS in the range of about 0.1 to 1.0 and a MS in the range of about 0.5 to 5, carboxymethylhydroxypropyl guar having a DS in the range of about 0.05 to 0.5 and a MS in the range of about 0.01 to 1.0, carboxyethylhydroxypropyl guar having a DS in the range of from about 0.01 to 0.5 and a MS in the range of from about 0.01 to 1.0 and mixtures thereof and a zirconium crosslinking agent with an aqueous acid solution said acid being present in sufficient quantities to form a high viscosity acidic treating fluid with a pH below 3 and which is stable at high temperatures; and

introducing said treating fluid into said formation.

4,324,669

FOAMED HIGH VISCOSITY AQUEOUS INORGANIC ACID SOLUTIONS AND METHODS OF USING THE SAME

Lewis R. Norman, and Tommy R. Gardner, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 19, 1979, Ser. No. 95,860
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **12 Claims**

1. A foamed and gelled aqueous inorganic acid solution consisting of:

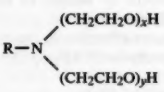
(a) an inorganic acid;

(b) water;

(c) an inert gas; and,

(d) a gelling-foaming agent, said gelling-foaming agent consisting of a water soluble organic solvent; and

a mixture of ethoxylated fatty amines having the general formula:



wherein: R is selected from saturated and unsaturated aliphatic groups having in the range of from about 8 to about 22 carbon atoms and mixtures thereof; the average sum of the value of x and y in said mixture is in the range of from about 1.8 to 2.2 and said ethoxylated fatty amine is present in said gelling agent in the range of from about 10.0% to about 80.0% by weight of said gelling agent.

4,324,670

PROCESS FOR MAKING A MIXED OXYALUMINUM ACYLATE COMPOSITION USEFUL IN GREASE MANUFACTURE

Charles E. Pratt, Signal Mountain, Tenn., assignor to Chattem, Inc., Chattanooga, Tenn.

Continuation-in-part of Ser. No. 96,933, Nov. 23, 1979, Pat. No. 4,280,917. This application Nov. 4, 1980, Ser. No. 201,271
Int. Cl.³ C10M *5/12, 7/16, 1/20*
U.S. Cl. 252—37.7 **13 Claims**

1. A process for making a composition comprised of mixed oxyaluminum acylate and mixed esters of carboxylic acid material, said process comprising the steps of sequentially,

(A) first heating a mixture of an aluminum alkoxide material and a carboxylic acid material to a first temperature which is above the melting point of said carboxylic acid material but which is below the boiling point of an alkanol material while agitating said mixture, said first heating being continued for a time sufficient to form a substantially homogeneous mixture,

(1) said aluminum alkoxide material being characterized by the formula:

$Al(OR)_3$

where R is a lower alkyl radical,

(2) said carboxylic acid material being comprised of:

(a) at least one aliphatic monocarboxylic acid containing from 8 to 40 carbon atoms per molecule, and

(b) at least one aromatic monocarboxylic acid containing from 7 to 14 carbon atoms per molecule,

(c) the mole ratio of said aromatic acid to said aliphatic acid ranging from about 2:3 to 19:1.

(3) said alkanol material being characterized by the formula:

ROH

where R is defined above and where ROH is derived from reaction between said aluminum alkoxide material and said carboxylic acid material,

(4)the mole ratio of said aluminum alkoxide material to said carboxylic acid material is about 1 to 2,

(B) secondly heating said liquid to second temperatures in the range where said alkanol material is distilled off and maintaining said second heating for a time sufficient to remove the equivalent of at least about 2 theoretical moles of said alkanol based upon said aluminum alkoxide material, and

(C) thirdly heating the resulting product from said second heating to gradually increasing third temperatures from a temperature corresponding to the final temperature of said second heating up to about 200° C., thereby to convert said resulting product into a homogeneous final liquid having a viscosity substantially less than that of said resulting product from said second heating.

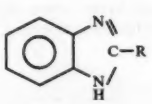
4,324,671

GREASE COMPOSITIONS BASED ON FLUORINATED POLYSILOXANES

John B. Christian, Yellow Springs, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 100,180, Dec. 4, 1979, abandoned. This application Feb. 10, 1981, Ser. No. 233,277
Int. Cl.³ C10M *1/32, 1/50*
U.S. Cl. 252—49.6 **14 Claims**

1. A grease composition comprising a major amount of a fluorinated polysiloxane base fluid, a minor amount of a thickening agent for the base fluid, and a rust and corrosion inhibiting amount of a benzimidazole having the following structural formula:



wherein R is hydrogen, hydrocarbon alkyl, hydrocarbon aryl, perfluoroalkyl or perfluoroalkyleneether.

4,324,672

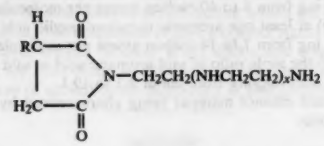
DISPERSANT ALKENYLSUCCINIMIDES CONTAINING OXY-REDUCED MOLYBDENUM AND LUBRICANTS CONTAINING SAME

Stephen A. Levine; Raymond C. Schlicht, both of Fishkill, and Harry Chafetz, Poughkeepsie, all of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,709
Int. Cl.³ C10M *1/54*
U.S. Cl. 252—49.7 **4 Claims**

1. A composition of matter having oxidation inhibiting, dispersant and friction reducing properties in lubricants consisting essentially of the product obtained by reacting a hexava-

lent salt or oxide of molybdenum with from 15:1 to 1:15 equivalents of hydrogen peroxide and then with an alkenyl succinimide of the formula:



wherein R is an alkenyl radical having from 50 to 200 carbon atoms in the chain and x ranges from 0 to 10.

4. A lubricant comprising a major amount of an oil of lubricating viscosity and a sufficient amount of the composition of claim 1 to provide from 0.01 to 1.0 percent by weight of molybdenum in said lubricant.

4,324,673

GREASE COMPOSITIONS BASED ON POLYFLUOROALKYLETHERS

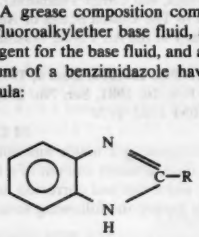
John B. Christian, Yellow Springs, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 100,179, Dec. 4, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,546

Int. Cl.³ C10M *1/32, 1/50*

U.S. Cl. 252—51.5 R 14 Claims

1. A grease composition comprising a major amount of a polyfluoroalkylether base fluid, a minor amount of a thickening agent for the base fluid, and a rust and corrosion inhibiting amount of a benzimidazole having the following structural formula:



wherein R is hydrogen, hydrocarbon alkyl, hydrocarbon aryl, perfluoroalkyl or perfluoroalkyleneether.

4,324,674

AMINE SALT STABILIZED PHOSPHATE ESTER-BASED FUNCTIONAL FLUID

Hugh S. MacKinnon, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 28, 1980, Ser. No. 182,159

Int. Cl.³ C10M *3/26, 3/28*

U.S. Cl. 252—78.5 8 Claims

1. An erosion-inhibited phosphate ester-based functional fluid comprising a major amount of a phosphate ester and from 10 to 50,000 parts per million by weight of a perfluorinated anionic surfactant selected from the soluble amine salts of a perfluoroalkane sulfonic acid or perfluoroalkane disulfonic acid wherein the alkane is from 1 to 18 carbon atoms.

4,324,675

PROTECTIVE ADDITIVE FOR RADIATORS IN COOLANTS CONTAINING WATER

Klaus Barthold, Weinheim, and Gert Liebold, Edingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 220,799

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1980, 3000687

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—79 10 Claims

1. An anticorrosive additive free of nitrites, amines, and phosphates for use in an aqueous solution to inhibit the corrosion of metals present in the cooling system of a water-cooled internal combustion engine consisting essentially of in admixture

(A) an effective corrosion inhibiting amount of at least one conventional corrosion inhibitor for metals and

(B) an effective corrosion inhibiting amount of at least one nucleus-substituted benzoic acid having strongly electron-attracting groups and a pKa of less than 3 selected from the group consisting of the halogen-ring-substituted benzoic acids.

4,324,676

COMPOSITIONS CONTAINING β-DIKETO CHELATING COMPOUNDS

Herman S. Gilbert, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 21, 1980, Ser. No. 113,911

Int. Cl.³ C23F *11/12;* C09K *5/00*

U.S. Cl. 252—79 8 Claims

1. An aqueous corrosion resistant glycol composition comprising

(A) 25 to 98 percent by weight of an alkylene glycol or mixtures of alkylene glycols,

(B) a soluble amount effective to reduce metal corrosion of β-dicarbonyl compounds having the formula

$$R_1\text{-}C(O)\text{-}C(R_2)(R_3)\text{-}C(O)\text{-}R_4$$

where

R_1 and R_4 are independently alkyl groups of 1–4 carbons, and alkoxy groups, of 1–4 carbons,

R_2 and R_3 are hydrogen, hydroxyl, alkyl groups of 1–4 carbons, or acetyl groups, with the proviso that R_1 and R_2 can be joined to form a 5 or 6 membered ring when R_3 is hydrogen and R_4 is an alkyl group of 1–4 carbons,

with the proviso that R_1 and R_4 can be joined to form a 5 membered ring when R_2 is hydrogen and R_3 is an alkyl group of 1–4 carbons,

with the proviso that R_1 and R_4 can be joined to form the 1,2-phenylene group when R_2 and R_3 are hydrogen, and with the proviso that R_1 and R_4 can be joined to form the 1,2 phenylene group when R_2 is hydroxyl and R_3 is the 2-hydroxy 1,3-dione-indanyl-2 group.

4,324,677

STABLE DISHWASHING AGENT COMPOSITIONS CONTAINING ACTIVE CHLORINE

Jochen Kaufmann; Theodor Altenschöpfer, both of Dusseldorf; Klaus Schumann, Erkrath, and Friedel Rings, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 221,341

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3000981; Mar. 1, 1980, 3007998

Int. Cl.³ C11D *7/56, 7/54*

U.S. Cl. 252—99 12 Claims

1. A stable, alkaline, granulated dishwashing agent composition containing active chlorine and alkali metal hydroxide for

use in mechanical dishwashers consisting essentially of an admixture of:

(a) from 1% to 30% by weight of finely divided trichloroisocyanuric acid in the form of granulates or prills having particles of which more than 84% by weight pass through a screen with an inside mesh diameter of 1.6 mm and more than 90% by weight are retained by a screen with the inside mesh diameter of 0.2 mm and having a degree of purity of ≧99% as determined by laser-Raman spectroscopy,

(b) from 10% to 40% by weight of granulated alkali metal hydroxide having particles of which more than 80% by weight pass through a screen with an inside mesh diameter of 1.6 mm and less than 10% by weight pass through a screen with an inside mesh diameter of 0.2 mm,

(c) from 5% to 60% by weight of builders selected from the group consisting of alkali metal polyphosphates and mixtures of said polyphosphates with up to 60% by weight of the builders of synthetic, water-insoluble alkali metal aluminosilicates having a calcium binding capacity of between 50 and 200 mg CaO/gm of anhydrous inorganic active substance,

(d) from 5% to 50% by weight of alkali metal silicates,

(e) from 2% to 50% by weight of alkali metal carbonates, or sulfates, and

(f) from 0 to 5% by weight of nonionic surface-active compounds.

4,324,678

METHOD OF CLEANING FIBREGLASS

Barry R. Howson, 21 Rochdale Rd., Mount Claremont, Western Australia, Australia

Filed Nov. 20, 1980, Ser. No. 208,573

Claims priority, application Australia, Nov. 23, 1979, PE1455

Int. Cl.[3] B60S *1/00;* B63B *59/00;* C11D *7/08, 7/10*

U.S. Cl. 252—136 **8 Claims**

1. A method of cleaning fibreglass which comprises applying thereto an aqueous composition, the composition containing from about 40 to 50% W/W of phosphoric acid, from about 0.1 to 3.0% by weight of a wetting agent and from about 0.1 to 5.0% W/V of ferrous ammonium sulphate.

4,324,679

CONTROLLING ODOR IN PHOTOPOLYMERIZATION

Robert C. Carlson, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 876,113, Feb. 8, 1978, Pat. No. 4,218,531. This application Feb. 21, 1980, Ser. No. 123,268

Int. Cl.[3] G03C *1/68;* C08F *8/18, 8/34*

U.S. Cl. 252—182 **6 Claims**

1. A liquid composition consisting essentially of:

(a) aromatic sulfonium complex salt, said salt being photodecomposable and being capable of initiating polymerization of cationically polymerizable monomers upon exposure to actinic radiation;

(b) at least about 15% by weight of liquid neutral oxyethylene-containing material selected from:

(i) compounds having the formula

$$R[(OC_2H_4)_n(OC_3H_6)_mOH]_p$$

where R is a polyvalent neutral organic radical having a valence of p, n+m is in the range of 1 to about 25, p is in the range of 2 to 6, wherein the oxyethylene units in such compounds constitute at least about 15% by weight of such compounds; and wherein the number of carbon atoms in R divided by the product of n and p is less than three; and

(ii) compounds having the formula:

$$R^1(OC_2H_4)_n(OC_3H_6)_mOH$$

where R^1 is monovalent neutral organic radical, where n+m is in the range of 1 to 25, wherein the oxyethylene units in such compounds constitute at least about 50% by weight of such compounds; and

(iii) compounds of the formula:

$$H(OC_2H_4)_n(OC_3H_6)_mOH$$

where n+m is in the range of 2 to about 25, wherein the oxyethylene units in such compounds constitute at least about 15% by weight of such compounds; and

(c) an organic material containing at least one site of non-aromatic carbon-carbon unsaturation; wherein said unsaturation in said organic material is ethylenic and wherein each ethylenically unsaturated carbon atom has no more than one hydrogen atom bonded thereto; and wherein said organic material is present in an amount of about 0.5 to 20% by weight of said composition.

4,324,680

SILVER-SILVER CHLORIDE ELECTRODE AND MANUFACTURING METHOD THEREOF

Misao Kubota, Maruko; Yoshitada Hanai, Ueda, and Toshiaki Yamaguchi, Tobu, all of Japan, assignors to Totoku Electric Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 180,428

Int. Cl.[3] H01M *4/58, 4/04*

U.S. Cl. 252—182.1 **8 Claims**

1. A silver-silver chloride electrode characterized in that said electrode is obtainable by forming silver chloride on the surface of silver powder particles in a proportion of 0.05 to 80% by weight and compression-forming the resultant compound powder.

4. A method of manufacturing a silver-silver chloride electrode comprising the steps of chemically reacting silver powder particles with chlorine in a solution containing chlorine ions or in a gas mixture containing chlorine or a chlorine compound to form silver chloride on the surface of the silver powder particles, and compression-forming the resultant silver-silver chloride compound powder into a desired shape.

4,324,681

CHIRAL SUPPORTS FOR RESOLUTION OF RACEMATES

David W. House, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 12, 1980, Ser. No. 158,750

Int. Cl.[3] B01D *15/08*

U.S. Cl. 252—184 **9 Claims**

1. A composition for resolution of racemic mixtures comprising:

(a) a core support selected from the group consisting of silica and alumina;

(b) a spacer molecule, one terminus of which is bonded to at least one oxygen atom of the core support via a silicon atom;

(c) a chiral amino acid or derivative thereof covalently bonded to the remaining terminus of the spacer molecule via amidation of a carboxyl group so as to retain its chirality.

4,324,682
ENCAPSULATED FLUORESCENT COMPOSITION

Norma A. Weston, Annandale, and Edward J. Schurdak, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 178,529, Dec. 18, 1970, abandoned. This application Jun. 18, 1973, Ser. No. 371,424

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.27 **9 Claims**

1. A continuous, pressure rupturable capsule useful for marking and identification purposes, insoluble in (B) and having encapsulated therein a composition consisting essentially of (A) from about 5% to about 50% of a fluorescent material and (B) from about 50% to about 95% of a water-insoluble, volatile, hydrocarbon solvent, said percentages being by weight based on the total weight of (A) and (B).

4,324,683
ENCAPSULATION OF LABILE BIOLOGICAL MATERIAL

Franklin Lim, Richmond, and Richard D. Moss, Chester, both of Va., assignors to Damon Corporation, Needham Heights, Mass.

Filed Aug. 20, 1975, Ser. No. 606,166

Int. Cl.³ B01J *13/02;* **A61K** *9/50*

U.S. Cl. 252—316 **39 Claims**

1. A process for encapsulating a chemically active core material in a porous capsule membrane from which the active core material cannot diffuse, said membrane comprising a polymer selected from the group consisting of polyamides, polyesters, polyureas, polycarbonates, and polysulfonamides, said process comprising the steps of:

1. preparing a solution of a first monomer and said core material in a first solvent selected from the group consisting of water and hydrophilic solvents, said first monomer being selected from the group consisting of polyols and diamines;
2. emulsifying said solution in a hydrophobic solvent in which the first monomer is slightly soluble to produce a hydrophilic discontinuous phase;
3. adding a second monomer selected from the group consisting of diacids, diacid halides, diisocyanates, and multifunctional sulfonyl halides to said emulsion to cause an interfacial polymerization reaction between the first and second monomers at the interface of the phases of the emulsion to form macroporous polymeric capsule membranes about the members of the discontinuous phase;
4. separating the capsules produced in step 3 from the hydrophobic solvent to terminate the polymerization reaction;
5. resuspending the capsules in a liquid, said liquid being selected to be less soluble with said first monomer than said hydrophobic solvent;
6. adding a second portion of said second monomer to the resuspension to cause further polymerization at said capsule membranes to strengthen said membranes and to render them microporous yet impermeable to said core material; and
7. quenching the polymerization reaction in the resuspension.

4,324,684
STABLE COMPOSITIONS FOR USE AS CORROSION INHIBITORS

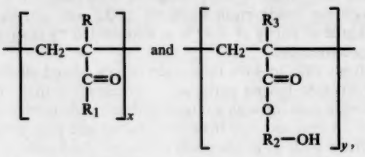
Gary E. Geiger, Philadelphia, and Roger C. May, Glenside, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 89,076, Oct. 29, 1979, and a continuation-in-part of Ser. No. 27,346, Apr. 5, 1979, abandoned. This application Mar. 19, 1980, Ser. No. 131,592

Int. Cl.³ C23F *11/18, 11/16, 11/14, 11/12*

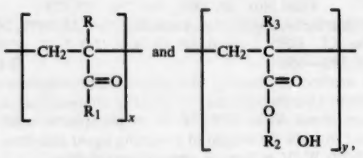
U.S. Cl. 252—389 A **20 Claims**

1. A composition comprising in combination:
(i) water-soluble zinc compound,
(ii) water-soluble chromate compound, and
(iii) water-soluble polymer comprising moieties derived from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



where R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, NH_2 or OM where M is a water-soluble cation; R_2 is a lower alkyl of about 2 to 6 carbon atoms, R_3 is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1, said polymer being capable of retaining a corrosion inhibiting amount of said zinc compound in soluble form in said aqueous medium.

13. A composition comprising in combination:
(i) water-soluble zinc compound,
(ii) water-soluble chromate compound,
(iii) water-soluble orthophosphate or precursor thereof, and
(iiii) water-soluble polymer comprising moieties derived from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



where R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, NH_2 or OM where M is a water-soluble cation; R_2 is a lower alkyl of about 2 to 6 carbon atoms, R_3 is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1, said polymer being capable of retaining a corrosion inhibiting amount of said zinc compound in soluble form in said aqueous medium.

4,324,685
BLOOD SERUM REFERENCE STANDARD

Allan L. Louderback, Temple City, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 925,481, Jul. 17, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,609

Int. Cl.³ G01N *33/16;* **C09K** *3/00*

U.S. Cl. 252—408 **5 Claims**

1. An improved blood serum reference composition of the type comprising blood serum having constituents of known values, characterized in that said standard further comprises a water soluble amine chloride selected from a group consisting of dimethylamine hydrochloride, diethylamine hydrochloride, monomethylamine hydrochloride, monoethylamine hydrochloride, trimethylamine hydrochloride, and triethylamine hydrochloride.

4. A process for reconstituting a freeze-dried blood serum reference composition comprising blood serum having constituents of known values comprising adding to said freeze-dried standard a diluent comprising a water soluble amine chloride selected from a group consisting of dimethylamine hydrochloride, diethylamine hydrochloride, monomethylamine hydrochloride, monoethylamine hydrochloride, trimethylamine

hydrochloride, and triethylamine hydrochloride and a composition selected from a group consisting of sodium carbonate and sodium bicarbonate.

4,324,686

HEMATOLOGY CONTROL COMPOSITION AND METHODS FOR ITS USE

David D. Mundschenk, Minneapolis, Minn., assignor to R & D Systems, Inc., Minneapolis, Minn.

Filed Jun. 11, 1979, Ser. No. 47,063
Int. Cl.³ G01N *33/16;* C09K *3/00*
U.S. Cl. 252—408 **11 Claims**

1. A control blood platelet preparation comprising bovine or porcine blood platelets stabilized as to size and against surface aggregation and derived, respectively, from bovine or porcine platelet rich blood plasma, the platelets of the preparation being larger in size than, but substantially retaining the natural log-normal volume size distribution of, the platelet rich blood plasma from which the platelets were derived.

8. A method for preparing a control blood preparation comprising:

(a) Providing bovine or porcine platelet rich blood plasma;

(b) Swelling the platelets of said plasma to a size within the size range corresponding to human blood platelets while substantially maintaining the natural log-normal platelet distribution; and

(c) Stabilizing and fixing the platelets to inhibit surface aggregation and fix their size.

4,324,687

BLOOD BIOCHEMISTRY CONTROL STANDARD

Allan L. Louderback, 9661 Longden Ave., Temple City, Calif. 91780, and Paul R. Szatkowski, 24 Winthrop Rd., Bethel, Conn. 06801

Continuation-in-part of Ser. No. 12,849, Feb. 15, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,065
Int. Cl.³ G01N *33/48;* C09K *3/00*
U.S. Cl. 252—408 **4 Claims**

1. A blood biochemistry control standard for the quality control of the analytical measurement of non-gaseous blood biochemistry components comprising an aqueous suspension of red blood cells which are (a) stabilized by mild treatment with aldehyde and saline at ambient temperature whereby said cells are lyseable in water and then (b) slowly and gradually equilibrated by washing over a period of at least about five minutes with an aqueous biochemical wash solution of at least one additionally incorporated non-gaseous biochemical analyte selected from the group consisting of the following analytes in the following concentrations of clinical diagnostic significance:

Sodium: 120 to 160 meq/l
Potassium: 2 to 9 meq/l
Urea: 10 to 130 mg/dl
Glucose: 25 to 500 mg/dl
Uric acid: 2 to 12 mg/dl
Chloride: 80 to 130 meq/l
Magnesium: 0.5 to 5 meq/l
Creatinine: 0.5 to 10 mg/dl
Phosphorus: 0.5 to 10 mg/dl
Calcium: 0.5 to 14 mg/dl
Bicarbonate: 3 to 40 meq/l
Iron: 25 to 300 μgm/dl
Lithium: 0.2 to 4 meq/l
Bilirubin: 0.5 to 30 mg/dl.

4,324,688

REGENERATION OF CRACKING CATALYST

Leonce F. Castagnos, Jr., Nederland; William R. Menzies, III, Houston, and Roy E. Pratt, Groves, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 963,243, Nov. 22, 1978, abandoned, which is a continuation of Ser. No. 535,270, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 272,264, Jul. 17, 1972, abandoned. This application Apr. 21, 1980, Ser. No. 142,582
Int. Cl.³ B01J *29/38, 21/20;* C10G *11/05, 11/04*
U.S. Cl. 252—417 **3 Claims**

1. In a process for regeneration of coke-contaminated fluidized cracking catalyst which has been partially deactivated with coke deposits in a fluidized catalytic cracking zone, wherein said coke-contaminated catalyst is introduced into a single dense catalyst phase contained in the lower portion of a regeneration vessel maintained at a temperature sufficient to support combustion of the coke, wherein said dense catalyst phase is fluidized by an upwardly flowing molecular oxygen-containing regeneration gas which combusts said coke, wherein a single dilute phase comprising regeneration gas containing oxygen and carbon oxides, and entrained catalyst is maintained in the upper portion of said regeneration vessel in direct communication with said dense catalyst phase, wherein a flue gas comprising carbon oxides is recovered from the top of said regeneration vessel, and wherein a regenerated catalyst of reduced coke contamination is recovered from said dense catalyst phase; the improvement for essentially completely combusting said coke to carbon dioxide in said dense catalyst phase and for avoiding afterburning in said dilute phase which comprises:

(a) maintaining said dense phase catalyst bed at a temperature of 1420° F. to 1445° F. and greater than the temperature in the dilute phase but sufficient to initiate and substantially complete carbon monoxide combustion within said dense phase bed, wherein said dense phase temperature is less than a temperature which will thermally deactivate said catalyst;

(b) maintaining a flow of oxygen-containing regeneration gas to said dense phase bed sufficient for maintaining a molar excess of oxygen in said flue gas; and

(c) maintaining an amount of catalyst in said dense phase bed sufficient to provide adequate catalyst residence time for burning coke from said catalyst and absorbing heat of combustion such that said regeneration gas and said catalyst entering said dilute phase are at a temperature sufficient for combustion of carbon monoxide to carbon dioxide and less than a temperature which will thermally deactivate said catalyst.

2. The method of claim 1, including adjusting oxygen supplied to said dense phase regeneration zone for varying the mole percent excess oxygen in said flue gas, wherein a change in said mole percent excess oxygen is inversely proportional to carbon remaining on regenerated catalyst and to percent carbon monoxide in said flue gas wherein the molar excess of oxygen in said flue gas is maintained within the range of about 1–10 volume percent, wherein residence time of catalyst in said dense phase is within the range of about 3–10 minutes, wherein said dilute phase temperature is maintained within the range of 1375° F. to about 1395° F.; wherein carbon monoxide content of said flue gas is about 500 ppm or less, and wherein carbon on regenerated catalyst is about 0.15 weight percent or less.

3. In a process for regeneration of coke-contaminated fluidized cracking catalyst which has been partially deactivated with coke deposits in a fluidized catalytic cracking zone, wherein said coke-contaminated catalyst is introduced into a single dense catalyst phase contained in the lower portion of a regeneration vessel maintained at a temperature sufficient to support combustion of the coke, wherein said dense catalyst phase is fluidized by an upwardly flowing molecular oxygen-containing regeneration gas which combusts said coke, wherein a single dilute phase comprising regeneration gas containing oxygen and carbon oxides and entrained catalyst is

maintained in the upper portion of said regeneration vessel in direct communication with said dense catalyst phase, wherein a flue gas comprising carbon oxides is recovered from the top of said regenerator vessel, and wherein a regenerated catalyst of reduced coke contamination is recovered from said dense catalyst phase, the improvement for essentially completely combusting said coke to carbon dioxide in said dense catalyst phase and for avoiding afterburning in said dilute phase which comprises:

(a) maintaining said dense phase catalyst bed at a temperature of 1420° F. to 1445° F. and greater than the temperature of the dilute phase but sufficient to initiate and to substantially complete carbon monoxide combustion within said dense phase bed, wherein said dense phase temperature is less than a temperature which will thermally deactivate said catalyst;

(b) maintaining a flow of oxygen-containing regeneration gas to said dense phase bed sufficient for maintaining a molar excess of oxygen in said flue gas;

(c) maintaining an amount of catalyst in said dense phase bed sufficient to provide adequate catalyst residence time for burning coke from said catalyst and absorbing heat of combustion such that said regeneration gas and said catalyst entering said dilute phase are at a temperature sufficient for combustion of carbon monoxide to carbon dioxide and less than a temperature which will thermally deactivate said catalyst; and

(d) simultaneously adjusting said dense catalyst phase temperature and the flow of oxygen to said fluidized dense catalyst phase to inhibit afterburn of carbon monoxide to carbon dioxide within said dilute phase, wherein a change in said dense phase temperature is inversely proportional to a change in said dilute phase temperature, wherein a change in mole percent oxygen in said flue gas is inversely proportional to residual carbon on regenerated catalyst and carbon monoxide content of said flue gas, wherein excess oxygen in said flue gas is within the range of about 1–10 mole percent; wherein residence time of catalyst in said dense phase is within the range of about 3–10 minutes, wherein said dilute phase temperature is maintained within the range of about 1375° F. to about 1395° F., wherein carbon monoxide content of said flue gas is about 500 ppm or less, and wherein carbon on regenerated catalyst is about 0.15 weight percent or less.

4,324,689

HIGH CARBON CONTENT CHROMATOGRAPHIC PACKING AND METHOD FOR MAKING SAME

Ramesh M. Shah, 3028 Lehigh Ct., Indianapolis, Ind. 46268

Filed Feb. 26, 1980, Ser. No. 124,711

Int. Cl.³ B01J *20/30, 20/22;* B01D *15/08*

U.S. Cl. 252—428 **12 Claims**

1. A method for making a 'reverse-phase' chromatographic packing having a carbon content of at least about 20% by weight comprising hydrolyzing silica gel by treating the silica gel with a mixture of sulfuric and nitric acids at a temperature which does not exceed 100° C., the strength of the acid mixture being sufficient to provide an exothermic reaction upon admixture with the silica gel, washing the treated silica gel to remove said acids, and drying the treated silica gel to maintain a water content of between about 5.5% to 9.5% water by weight of the silica gel, silanizing the hydrolyzed silica gel by: (a) reacting it with an alkylchlorosilane at a temperature which does not exceed 100° C., (b) washing the resulting product and (c) drying it to maintain a moisture content of between about 5.5% to 9.5% water by weight of the silica gel, and hydrolyzing the bonded chlorosilane to replace the chlorine atoms of the bonded chlorosilane with hydroxyl groups, washing the hydrolyzed product and then drying it, said carbon content being based upon the alkyl group of the bonded alkylchlorosilane.

10. A method according to claim **1** wherein reaction (a) is repeated after washing step (b) to obtain a silanized silica having a carbon content of at least 20% by weight.

11. A method according to claim **1** wherein a water content of between 7.5% and 8.5% by weight of the silica gel is maintained prior to hydrolyzing the bonded chlorosilane.

4,324,690

ALPHA-OLEFIN POLYMERIZATION CATALYST

Nicholas M. Karayannis, Naperville, and John S. Skryantz, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 14,891, Feb. 15, 1979, abandoned. This application Jan. 21, 1980, Ser. No. 113,542

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **17 Claims**

1. A catalyst composition comprising

(A) at least one organoaluminum component; and

(B) a solid reaction product of components comprising

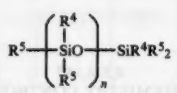
(1) at least one titanium(IV) halide or haloalcoholate containing 1 to about 20 carbon atoms per alcoholate group;

(2) at least one organic electron donor containing at least one of oxygen, nitrogen, sulfur and phosphorus; and

(3) at least one hydrocarbon-insoluble, magnesium-containing pretreatment product of components comprising

(a) at least one magnesium alcoholate and

(b) at least one organosilicon component selected from the group conisting of silanes corresponding to the formula R_xSiX_{4-x} wherein each R is independently a hydrocarbyl radical of 1 to about 20 carbon atoms, X is hydrogen or halogen and $1 \leqq x \leqq 4$; hydrocarbyl disilazanes and trisilazanes containing 1 to about 20 carbon atoms per hydrocarbyl radical; and liquid polysiloxanes corresponding to the formula



wherein each R^4 is independently a hydrocarbyl radical of 1 to about 20 carbon atoms, each R^5 is independently hydrogen or R^4 and n is an integer equal to or greater than 2,

wherein (3)(b) is present in an amount effective to improve polymerization performance, the atomic ratio of titanium in (1) to metal in (3) (a) is at least about 0.5:1, and (2) is employed in an amount ranging from about 0.001 to about 1 mole per gram-atom of titaniun contained in (1); said reaction product being prepared by combining, in the substantial absence of extraneous catalyst poisons, component (1) with a suspension of component (3) in an inert hydrocarbon or halogenated hydrocarbon diluent and then adding component (2) to the resulting mixture, or by adding a mixture of components (1) and (2) to a suspension of (3) in an inert hydrocarbon or halogenated hydrocarbon diluent.

4,324,691

CATALYST COMPONENT

Angus J. Hartshorn, Runcorn, and Eric Jones, Kelsall, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 1, 1980, Ser. No. 164,928

Claims priority, application United Kingdom, Jan. 10, 1980, 00889/80; Jun. 6, 1980, 18583/80

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **30 Claims**

1. A catalyst component which is the product of reacting a particulate support material which has a reactive surface comprising a plurality of sites on the surface of the support which are capable of abstracting a magnesium hydrocarbyl from a solution thereof with (a) at least one organomagnesium com-

pound in which magnesium is directly bonded through a carbon atom to a first hydrocarbyl group and is bonded to a halogen, or oxyhydrocarbyl or a second hydrocarbyl group, which hydrocarbyl group(s) is (are) alkyl, aryl, cycloalkyl, aralkyl, alkadienyl or alkenyl, (b) at least one aluminum compound of the general formula: R_nAlY_{3-n} wherein R, each of which may be the same or different, represents a hydrocarbyl group which is an alkyl, aryl, cycloalkyl, aralkyl, or alkadienyl group, n is 0, 1, 2, 3 or a fraction less than 3 and Y is a singly charged ligand which is hydride, fluoride, chloride, bromide, iodide or oxyhydrocarbyl, (c) at least one transition metal compound of Groups IVA, VA or VIA of the Periodic Table which is known to be useful in forming Ziegler-Natta catalysts, (d) at least one pacifying agent which is capable of breaking metal-carbon or metal-hydrogen bonds in the catalyst component but does not have a deleterious effect on the catalyst component and which is used in sufficient quantity to break substantially all the metal-hydrocarbyl or metal-hydride bonds in the catalyst component, and optionally one or more compounds selected from the group consisting of

an organometallic compound of the general formula: $R_m^1MX_p$ wherein M is a metal of Groups IA, IIA, IIB, IIIB, IVA, VA OR VIA of the Periodic Table, R^1 is a hydrocarbyl or a substituted hydrocarbyl group, X is a halogen, m is an integer up to the highest valency of the metal M and p is 0 or an integer up to 2 less than the valency of the metal M, except when M is a metal from Group VIA, p is always 0, and when M is a metal from Groups IVA, VA or VIA m has a value from 2 to the highest valency of the metal and p has a value from 0 to a value of 2 less than the valency of the metal M,

a halogenating agent and

a Lewis Base compound, with the proviso (i) that the particulate support material is treated with the at least one organomagnesium compound, the at least one aluminum compound of general formula R_nAlY_{3-n}, the at least one transition metal compound of Groups IVA, VA or VIA, and the one or more compounds selected from the aforesaid group, where one or more is used, prior to being treated with the at least one pacifying agent, except that where (a) the pacifying agent is a hydrogen halide and (b) the particulate support material is treated with the aluminum compound of general formula R_nAlY_{3-n} and the at least one organomagnesium compound separately, the pacifying agent may be added to the support after the support has been treated with the at least one organomagnesium compound and the aluminum compound of general formula R_nAlY_{3-n} and before the support is treated with the at least one transition metal compound of Groups IVA, VA or VIA and (ii) that where the support is treated with an organometallic compound $R_m^1MX_p$ it is treated with a halogenating agent and/or a Lewis base compound, in which catalyst component the molar ratio of the aluminum compound of general formula R_nAlY_{3-n} to the organomagnesium compound is between 0.5 and 100 and the molar ratio of the aforesaid aluminum compound to the transition metal compound is between 1.0 and 2000.

4,324,692

POLYMERIZATION CATALYST AND PROCESS

Alexander Johnstone, Stenhousemuir, Scotland, assignor to BP Chemicals Limited, London, England

Filed Oct. 8, 1980, Ser. No. 194,999

Claims priority, application United Kingdom, Oct. 12, 1979, 35462/79

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **9 Claims**

1. A process for preparing a supported Ziegler catalyst component comprising reacting together an alcohol and a halogen-containing transition metal compound having the general formula MOX_{m-2} or $M(OR)_{m-n}X_n$, wherein M is a transition metal, X is halogen, R is hydrocarbyl, $_m$ is the valency of M and $_n$ is an integer from 1 to $_m$ in the presence of a substantially anhydrous zinc halide so as to liberate hydrogen halide therefrom, and impregnating a support material containing at least some surface hydroxyl groups with the reaction mixture.

4,324,693

OLEFIN POLYMERIZATION CATALYST

Gregory G. Arzoumanidis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana)

Filed Oct. 10, 1980, Ser. No. 196,012

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **16 Claims**

1. In a method to produce an alpha-olefin polymerization catalyst comprising reducing titanium tetrachloride with an aluminum alkyl, contacting the resulting reduced solid with a pretreatment amount of alpha-olefin monomer under polymerization conditions, and reacting the resulting product with an ether complexing agent and additional titanium tetrachloride, the improvement comprising reacting a mixture of di-n-butyl and diisoamylethers in a molar ratio to the reduced titanium compound of greater than 1.15 to 1.

4,324,694

SUPPORTED CATALYSTS CONTAINING VANADIUM PENTOXIDE, TITANIUM DIOXIDE, PHOSPHORUS, RUBIDIUM AND/OR CESIUM, WITH OR WITHOUT ZIRCONIUM DIOXIDE

Peter Reuter, Bad Duerkheim; Kurt Blechschmitt, Schifferstadt, and Friedrich Wirth, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,782

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925682

Int. Cl.³ B01J *21/06, 23/04, 23/22, 27/16*

U.S. Cl. 252—435 **12 Claims**

1. A supported catalyst which contains vanadium pentoxide, titanium dioxide, phosphorus, rubidium and/or cesium, with or without zirconium dioxide, obtained by applying an appropriate solution or suspension of the components in two layers onto a preheated inert carrier, so that after drying, the catalyst

carries an 0.02–2 mm thick coating of the catalytic material, wherein the catalytic material used contains from 1 to 40% by weight of V_2O_5, from 60 to 99% by weight of TiO_2 and any optionally added ZrO_2 and, based on the total amount of TiO_2, ZrO_2 and V_2O_5, up to 2% by weight of phosphorus and up to 1.5% by weight of rubidium and/or cesium, and the application of the material is effected by first providing the preheated carrier with a layer of the catalytic material which contains more than 0.2 and up to 2% by weight of phosphorus but no rubidium and/or cesium and then providing the carrier, thus coated with a first, inner layer, with a second, outer layer of the catalytic material which contains from 0 to 0.2% by weight of phosphorus and from 0.02 to 1.5% by weight of rubidium and/or cesium, the coating being applied in such a way that the catalytic material of the outer layer—which is free from phosphorus or has the lower phosphorus content—of the supported catalyst accounts for from 10 to 90% by weight of the total catalytic material.

4,324,695

CATALYST COMPOSITIONS OF TRANSITION METAL CARBONYL COMPLEXES INTERCALCATED WITH LAMELLAR MATERIALS

James A. Hinnenkamp, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,166

Int. Cl.³ C01B *1/02, 2/06*

U.S. Cl. 252—437 **6 Claims**

1. An intercalate composition comprising graphite interca-

lated with transition metal, said transition metal being present substantially as transition metal carbonyl.

4,324,696

METHOD OF PREPARING CRYSTALLINE ZEOLITE CATALYST OF HIGH ACTIVITY

Joseph N. Miale, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,757
Int. Cl.[3] B01J *29/28*
U.S. Cl. 252—455 Z 8 Claims

1. A method for preparing a super active synthetic crystalline zeolite catalyst material of high hydrocarbon conversion activity having a constraint index between about ½ and 12 and a SiO_2/Al_2O_3 mole ratio greater than 7 which comprises contacting the hydrogen form of zeolite ZSM-12, ZSM-20 or ZSM-23 with steam followed by base exchange of the resultant steamed product with an ammonium salt.

4,324,697

FLUORIDED COMPOSITE CATALYST

Paul H. Lewis, Groves, Tex., and James C. Vartuli, West Chester, Pa., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,662
Int. Cl.[3] B01J *29/12*
U.S. Cl. 252—455 Z 3 Claims

1. An improved composite cracking catalyst consisting essentially of from about 90 to about 95 percent by weight of a composite of a Y zeolite in a silica-alumina matrix, and from about 5 to about 10 percent by weight of a fluorided metallic reforming catalyst comprising platinum on alumina and containing from about 0.01 to about 2 percent by weight platinum and from about 0.5 to about 5 percent by weight fluorine.

4,324,698

FLUORIDED CRACKING CATALYST

Paul H. Lewis; Joseph A. Durkin, both of Groves, and Joseph A. Froelich, Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,859
Int. Cl.[3] B01J *29/12, 37/26*
U.S. Cl. 252—455 Z 8 Claims

1. An improved fluorided zeolite type cracking catalyst consisting essentially of at least 90 percent by weight of a composite of a Y-zeolite in a silica-alumina matrix and containing about 0.1 to about 5 percent by weight of fluorine, said improved cracking catalyst prepared by contacting said composite with an aqueous solution of a fluorine compound, in an amount just sufficient for incipient wetting of said composite for a period of 16 to 24 hours, drying, and calcining the resulting fluorided catalyst.

8. An improved method for the preparation of a fluorided zeolite cracking catalyst containing from about 0.1 to about 5 percent fluorine by weight which comprises contacting a composite of a Y zeolite in a silica-alumina matrix with an aqueous solution of a fluorine compound in an amount just sufficient to produce incipient wetness of said composite for a period of 16 to 24 hours at 32° F., and thereafter drying and calcining the resulting fluorided composite.

4,324,699

SUPPORTED CATALYSTS AND THEIR TREATMENT FOR THE PREPARATION OF ETHYLENE OXIDE

Wolf D. Mross; Eckart Titzenthaler, both of Ludwigshafen; Juergen Koopmann, Neustadt; Volker Vogt, Wachenheim, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,732
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904919
Int. Cl.[3] B01J *21/04, 23/04, 23/50*
U.S. Cl. 252—463 8 Claims

1. A process for the treatment of supported catalysts containing silver and alkali metals, for the preparation of ethylene oxide from ethylene and oxygen in the gas phase, which process comprises modifying a new supported catalyst which already contains metallic silver and may or may not contain the light alkali metal lithium and/or sodium with a modifier solution containing at least one of the heavy alkali metals, potassium, rubidium and/or cesium, the modifier solution used also containing

(a) a surfactant and/or
(b) a reducing agent.

4,324,700

PROCESS FOR PREPARING PLATINUM GROUP METAL CATALYSTS

John P. Heffer, Reading, England, assignor to Johnson Matthey Public Limited Company, London, England

Continuation-in-part of Ser. No. 100,881, Dec. 6, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,626
Claims priority, application United Kingdom, Dec. 8, 1978, 47720/78
Int. Cl.[3] B01J *23/42, 23/44, 23/46*
U.S. Cl. 252—472 9 Claims

1. A process for the preparation of a catalyst containing a catalytic metal comprising the steps of:

(a) precipitation of a hydroxide or hydrated oxide of the catalytic metal from a solution containing a water soluble salt of the catalytic metal,
(b) collection of the precipitate from step (a) and redispersal to form a dispersion in a fresh quantity of water,
(c) passage through the dispersion of step (b) of a sufficient quantity of sulphur dioxide gas to cause dissolution by sulphurous acid of substantially all the solid hydroxide or hydrated oxide,
(d) contacting a solid support, to which a washcoat of a high surface area refractory metal oxide has previously been applied, with the requisite volume of solution obtained from step (c) thus causing adsorption of a catalytic metal containing species to the external surface of the said solid support, and
(e) drying and firing the solid obtained from step (d) thus producing an active catalyst.

4,324,701

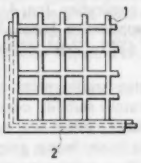
RECTANGULAR-SOLID PACKAGED CATALYST ASSEMBLY

Mitsuyasu Honda; Yoshihiro Shiraishi, and Toru Seto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 3, 1980, Ser. No. 212,559
Claims priority, application Japan, Dec. 13, 1979, 54-161922
Int. Cl.[3] B01J *12/00;* F01N *3/28*
U.S. Cl. 252—477 R 3 Claims

1. An improved rectangular-solid catalyst assembly of the type having a plurality of rectangular-solid unit catalysts stacked and assembled together, the unit catalysts having a honeycomb structure with a multiplicity of gas passages each extending from a gas inlet end to a gas outlet end, the improvement comprising, in combination therewith, heat-resistant

packings covering at least the vertices and the neighboring peripheral areas of the faces of the unit catalysts other than the gas-passage faces thereof and also covering the edges of the gas-passage faces surrounding the gas passages, a rectangular-



solid housing, said packings being integrally secured to said unit catalysts and packed together in said rectangular-solid housing, and retaining strips placed over the edges of the gas-passage faces on at least one of said unit catalysts and securely attached to said housing:

4,324,702

OXIDE THERMISTOR COMPOSITIONS

Yoshihiro Matsuo, Neyagawa; Takuoki Hata, Sakai, and Takayuki Kuroda, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 28, 1980, Ser. No. 201,441

Claims priority, application Japan, Nov. 2, 1979, 54-142233; Nov. 2, 1979, 54-142239; Nov. 10, 1979, 54-145840; Dec. 14, 1979, 54-162949; Dec. 14, 1979, 54-162950; Jan. 18, 1980, 55-4905

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—519 **5 Claims**

1. Oxide thermistor composition consisting essentially of metal oxide, wherein said metal consists essentially of 94.6 to 30 atomic % of Mn ion, 5 to 30 atomic % of Ni ion, 0.1 to 15 atomic % of at least one kind of ion selected from the group consisting of Cu and Fe, and 0.3 to 40 atomic % of Cr ion.

4,324,703

POLYOL FRAGRANCE FIXATIVES

Abraham Seldner, Princeton, N.J., assignor to Amerchol Corporation, Edison, N.J.

Division of Ser. No. 106,791, Dec. 26, 1979, Pat. No. 4,264,478, which is a continuation-in-part of Ser. No. 955,672, Oct. 30, 1978, abandoned. This application Dec. 11, 1980, Ser. No. 215,972

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **14 Claims**

1. A fragrance composition comprising aromatic materials and from about 0.5% to about 5% by weight of the alcoholic, aqueous or hydroalcoholic content of said composition of an alkoxylated methyl glucoside.

4,324,704

PROCESS FOR HYDROGENATION OF DAMASCENONE, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES OF SAID PRODUCTS

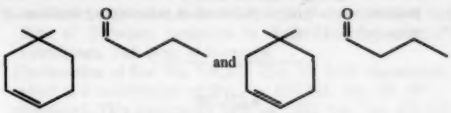
Robert W. Trenkle, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 969,852, Dec. 15, 1978, Pat. No. 4,292,447. This application Feb. 27, 1981, Ser. No. 238,680

Int. Cl.³ A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 R **3 Claims**

1. A process for augmenting or enhancing the aroma of a perfume composition or a cologne comprising the step of adding to a perfume base or a cologne base an aroma augmenting or enhancing quantity of at least one compound having the structure selected from the group consisting of:



4,324,705

PROCESS FOR RECOVERING MATERIALS FROM SCRAPPED FILM

Kunihira Seto, and Kyoichi Naruo, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1980, Ser. No. 158,755

Claims priority, application Japan, Jun. 13, 1979, 54-74259

Int. Cl.³ C08J *11/04*

U.S. Cl. 521—44 **12 Claims**

1. A process for recovering materials from scrapped photographic film which comprises separating coating layers and a film base from a scrapped photographic film having at least one coating layer on a plastic film base, wherein the improvement comprises:

impregnating the coating layers of said scrapped film with a strong alkaline solution having a pH of at least 9.0 at 25° C. and stripping the coating layers by means of high pressure jet water having a temperature of from about 5° to 95° C. and a pressure of from about 3 to 50 kg/cm^2 to separate said coating layers from the film base before the coating layers are dissolved in or separated from the film base by said alkaline solution.

4,324,706

FRICTION MATERIAL

Yutaka Tabe; Hiromitsu Takamoto; Keizo Shimada, all of Iwakuni, and Yasusaburo Sugita, Tokyo, all of Japan, assignors to Teijin Limited and Adebono Brake Industry Co., Ltd., both of Osaka, Japan

Filed Jan. 14, 1981, Ser. No. 224,967

Claims priority, application Japan, Jan. 22, 1980, 55-5216

Int. Cl.³ C08L *21/00*

U.S. Cl. 523—149 **16 Claims**

1. A friction material comprising the elements of:

(A) 5 to 70% by weight of pulp-like particles consisting essentially of a heat-resistant aromatic polymeric material;

(B) 1 to 70% by weight of a fibrous material comprising at least one member selected from the group consisting of inorganic fibrous materials and heat-resistant organic fibrous materials;

(C) 1 to 35% by weight of a friction-regulating agent and;

(D) 5 to 40% by weight of a thermosetting polymeric resin.

4,324,707

FLOWABLE POLYACRYLONITRILE POWER TREATED WITH ESSENTIALLY PURE SOLVENT

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 1, 1980, Ser. No. 136,192

Int. Cl.³ C08K *5/36*

U.S. Cl. 524—173 **9 Claims**

1. A method for preparing free flowing particles consisting essentially of polyacrylonitrile polymer and essentially pure dimethyl sulfoxide which comprises:

(a) maintaining an agitated bed of finely-divided polyacrylonitrile particles in a dry essentially moisture free contact zone at temperature from about 1° C. to 18° C.;

(b) injecting finely-dispersed dimethyl sulfoxide into said contact zone at an addition rate sufficiently low to prevent significant agglomeration of the polyacrylonitrile particles, wherein about 80 to 140 parts by weight of dimethyl

sulfoxide are added per 100 parts by weight of polyacrylonitrile; and

(c) permitting migration of an effective amount of dimethyl sulfoxide into said particles while maintaining the contact zone below 18° C.

4,324,708

METALLIC PAINTING

Satoru Ito; Tadashi Watanabe, and Shinji Sugiura, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Division of Ser. No. 134,140, Mar. 26, 1980. This application Oct. 31, 1980, Ser. No. 202,763
Claims priority, application Japan, Apr. 5, 1979, 54-40305
Int. Cl.³ C08L 1/10, 1/14
U.S. Cl. 524—599 12 Claims

1. A metallic paint comprising:

(a) a modified vinyl-type copolymer obtained by copolymerizing 5–75% by weight of cellulose acetate butyrate with 95–25% by weight of a monomer component consisting of one or more vinyl-type monomers, as a vehicle component,

(b) a metallic powder, and

(c) an organic solvent.

4,324,709

PROCESS FOR INCORPORATING A MODIFIER OF PROPERTIES OF A SHAPED SYNTHETIC POLYMER CONTAINING A BIODEGRADABLE SUBSTANCE THEREIN, AND THE PRODUCT OF THE PROCESS

Gerald J. L. Griffin, London, England, assignor to Coloroll Limited, London, England

Division of Ser. No. 940,839, Sep. 8, 1978, Pat. No. 4,218,350. This application Feb. 20, 1980, Ser. No. 122,851
Claims priority, application United Kingdom, Sep. 16, 1977, 38772/77
Int. Cl.³ C08L 23/06, 23/12, 3/02
U.S. Cl. 523—210 5 Claims

1. A method of manufacturing a synthetic polymer based composition including a synthetic polymer and starch granules, said method comprising the steps of suspending the starch granules in a solution of a substance which modifies the properties of the composition in a solvent which does not dissolve the starch granules, evaporating the solvent thereby leaving the granules coated with the modifying substance, and mixing the coated starch granules with the synthetic polymer.

4,324,710

NATURALLY OCCURRING THERMOPLASTIC RESINS AS A SUBSTITUTE FOR VARIOUS PETROLEUM-DERIVED MATERIALS IN RUBBER STOCKS

James A. Davis, Uniontown, and Robert C. Koch, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1980, Ser. No. 193,198
Int. Cl.³ C08L 93/04; C09F 1/00
U.S. Cl. 524—76 9 Claims

1. In a cured rubber stock containing conventional rubber components, said stock being a layer in a rubber article, the improvement, comprising:

the stock layer having incorporated therein prior to curing thereof a minor portion of a thermoplastic resin derived from crude wood rosin and comprising carboxylic acid groups,

said thermoplastic resin substituted for at least 25% by weight of a petroleum derived product normally contained in said stock layer.

4,324,711

MELT-ADHESIVE TRAFFIC PAINT COMPOSITION

Tsugio Tanaka, Ageo; Kohichi Hashimoto, Urawa, and Yukio Nagasaka, Kawagoe, all of Japan, assignors to Atom Chemical Paint Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 805,465, Jun. 10, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,020
Claims priority, application Japan, Jun. 29, 1976, 51-76044
Int. Cl.³ C08L 77/08, 93/04; C09D 3/42
U.S. Cl. 523—172 12 Claims

1. A melt-adhesive traffic paint composition having improved low temperature stability consisting essentially of:

20–35% by weight of a dimer acid modified polyamide resin, said polyamide resin being prepared by condensing a dimer acid with a polyamine selected from the group consisting of ethylenediamine and diethylenetriamine,

1–5% by weight of a plasticizer selected from the group consisting of a phthalate, a trimellitate, a mixture of saturated linear C_6, C_8 and C_{10} alcohols, a mixture of saturated linear C_8 and C_{10} alcohols and a toluenesulfonamide,

30–45% by weight of an inorganic filler,

the balance being a coloring pigment and a reflective agent.

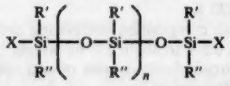
4,324,712

SILICONE RESIN COATING COMPOSITION

Howard A. Vaughn, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 964,910, Nov. 30, 1978. This application Jan. 18, 1980, Ser. No. 113,278
Int. Cl.³ C08K 3/36; C08L 83/06, 83/08
U.S. Cl. 524—767 11 Claims

1. An aqueous coating composition comprising a mixture of colloidal silica, a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, and flexibilizing amount of a linear functionally terminated oligosiloxane having the general formula,



wherein X is selected from the group consisting of hydroxy, alkoxy,

wherein Y is hydrogen or alkyl, R′ and R″ may be the same or different and are selected from the group consisting of alkyl, haloalkyl, cyanoalkyl and alkenyl and n is a number from about 1 to about 18, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica, 30 to 90 weight percent of the partial condensate, and 0.5 to 5 weight percent of said linear functionally terminated oligosiloxane, said composition having a pH of 7.1 to about 7.8.

4,324,713

TWO-PACKAGE SOLVENTLESS RUST PREVENTIVE MATERIAL

Ryuji Kita, Yokohama; Hisataka Komai, Kamakura; Makoto Wakabayashi, Koshigaya, and Haruyoshi Takagishi, Yamato, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo and Nisson Motor Co. Ltd., Kanagawa, both of, Japan

Filed Feb. 4, 1980, Ser. No. 118,321

Claims priority, application Japan, Feb. 9, 1979, 54-14538; Nov. 14, 1979, 54-148017

Int. Cl.³ C08G *63/00*

U.S. Cl. 523—457 10 Claims

1. A two-package rust preventive material which is free of volatile solvents, consisting essentially of (A) a sprayable component containing a liquid epoxy resin and a liquid polycarboxylic acid anhydride and (B) a sprayable component containing a liquid primary or secondary amino compound and a curing accelerator, at least one of said components (A) and (B) containing a diluent which is not reactive with epoxy resin compositions having a molecular weight of 300 to 4,000 and an electrically conductive powder.

4,324,714

VINYLIDENE CHLORIDE POLYMER MICROGEL POWDER LACQUER COATING COMPOSITION AND SUBSTRATES COATED THEREWITH

Dale S. Gibbs; James F. Sinacola, both of Midland, and Dan E. Ranck, Sanford, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 942,516, Sep. 15, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,169

Int. Cl.³ C09D *3/74;* C08K *5/15*

U.S. Cl. 524—113 8 Claims

1. A lacquer coating composition comprising an organic solvent and a crosslinked vinylidene chloride polymer microgel powder dispersed therein, said powder being recovered from a latex obtained by emulsion polymerizing a monomer mixture consisting essentially of

(a) about 85 to 92 parts by weight of vinylidene chloride,

(b) about 8 to 15 parts by weight of a copolymerizable ethylenically unsaturated comonomer,

and

(c) from about 2 to about 10 parts by weight of a copolymerizable crosslinking polyfunctional comonomer

wherein the microgels in the resulting latex have a gel content in the range of about 25 to 99 percent.

4,324,715

LOW CURING EPOXY N-RESIN COATING COMPOSITION

Dennis P. Emerick, Aston, Pa., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1980, Ser. No. 201,784

Int. Cl.³ C08K *5/10*

U.S. Cl. 523—400 6 Claims

1. A coating composition consisting essentially, in percent by weight of (A), (B), (C), (D) plus (E), of a dispersion in a liquid organic media of about:

(A) 10–50% of an epoxy resin containing, on the average, two terminal 1,2-epoxy groups per molecule and having an epoxy equivalent weight of 750–5000;

(B) 1–20% of a melamine formaldehyde resin;

(C) 1–10% particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms;

(D) 0.2–5% citric acid; and

(E) the balance being said liquid organic media.

4,324,716

SOLUTIONS OF POLYISOCYANATE POLYADDITION PRODUCTS

Artur Reischl, Leverkusen, and Gert Jabs, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 968,240, Dec. 11, 1978, abandoned, which is a continuation of Ser. No. 827,292, Aug. 24, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,633

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638759

Int. Cl.³ C08G *18/32, 18/14;* C08K *5/05, 5/06*

U.S. Cl. 524—761 4 Claims

1. A process for the preparation of clear, transparent, uniform and homogeneous polyhydric alcohol solutions of polyisocyanate polyaddition products with a solids content of 5 to 70% by weight in 30 to 95% by weight polyhydric alcohol solvent having a molecular weight between 62 and 200 comprising reacting:

(A) polyisocyanates or isocyanate containing prepolymers of polyisocyanates and higher molecular weight and/or low molecular weight polyhydroxyl compounds in situ with

(B) hydrazines and/or polyamines and/or dihydrazides and/or ammonia and optionally formaldehyde in

(C) polyhydric alcohols having a molecular weight of between 62 and 200,

optionally in the presence of water, and the water, if used, being subsequently removed in known manner.

4,324,717

NORBORNENE POLYMERS STABILIZED WITH HINDERED AROMATIC ALCOHOLS

Robert W. Layer, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

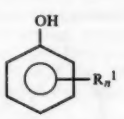
Filed Jun. 23, 1980, Ser. No. 162,300

Int. Cl.³ C08K *5/35, 5/34, 5/17*

U.S. Cl. 524—244 10 Claims

1. Composition of matter comprising a norbornene polymeric material and an antioxidant in amount sufficient to provide the desired degree of protection from oxidation degradation, said norbornene polymeric material is prepared from norbornene monomers that contain the following moiety:

where each R, R^1, R^2, R^3, and R^4 is selected from hydrogen, alkyl and alkenyl groups of 1 to 20 carbon atoms, and groups formed by joining R^3 and R^4 selected from aryl groups of 6 to 18 carbon atoms, and cycloalkyl and cycloolefin groups of 5 to 6 carbon atoms; said antioxidant is selected from (A) hindered phenols, (B) bis compounds of said hindered phenols, (C) hindered naphthols, and mixtures of said antioxidants, said hindered phenols are selected from compounds falling within the definition of the following structural formula:



where n represents 1 to 5 R^1 groups on the phenol ring with at least one R^1 group positioned ortho to the hydroxyl group on said phenyl ring, said R^1 group or groups are individually

selected from substituted and unsubstituted alkyl, alkoxy, hydroxyl, and hydroxyalkyl groups wherein carbon chains therein contain 1 to 12 carbon atoms; said R^1 group or groups are also individually selected from alkylaminoalkyl groups $—CH_2N(R^2)(R^3)$, provided, however, that at least one R^1 group is an alkylaminoalkyl group, where R^2 and R^3 groups are individually selected from hydrogen, and hydroxy substituted and unsubstituted normal and branched alkyl groups of 1 to 12 carbon atoms and where R^2, R^3 and N of said alkylaminoalkyl groups form a heterocyclic ring containing 5 to 7 atoms selected from carbon, nitrogen, oxygen, and sulfur atoms; said bis compounds of said hindered phenols are bridged through the nitrogen atom of said alkylaminoalkyl groups by a carbon chain containing 2 to 12 carbon atoms or by a heterocyclic structure of 5 to 7 atoms selected from carbon, nitrogen, oxygen, and sulfur atoms; and said hindered naphthols are defined same as said hindered phenols.

4,324,718

THERMAL STABILIZATION OF VINYL RESINS

Michel Foure, Artix, France, assignor to Societe Nationale Elf Aquitaine, France

Filed May 1, 1980, Ser. No. 145,679
Claims priority, application France, May 4, 1979, 79 11284
Int. Cl.³ C08K *5/36, 5/46*
U.S. Cl. 524—108 **19 Claims**

15. A halovinyl resin stabilized to heat which contains 0.09 to 1.65 percent by weight of a tin tetramercaptide the molecule of which contains 4 to 80 carbon atoms, and 0.1 to 1.6 percent by weight of a crown compound having 8 to 30 carbon atoms and 4 to 10 metalloid atoms selected from the group consisting of oxygen, sulfur and nitrogen.

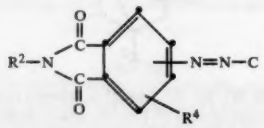
4,324,719

AZO DYES FROM AMINOPHTHALIMIDES AND ANILINE, TETRAHYDROQUINOLINE, AND BENZOMORPHOLINE COUPLERS HAVING THIOSULFATE GROUPS

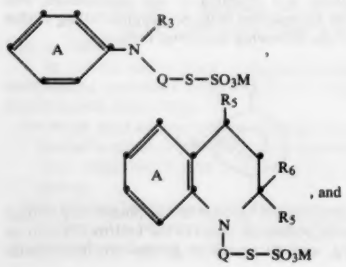
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1980, Ser. No. 159,093
Int. Cl.³ C09B *29/036, 29/36, 29/44;* **D06P** *3/26*
U.S. Cl. 260—152 **4 Claims**

1. A compound having the formula



wherein C is a coupler selected from those having the formula



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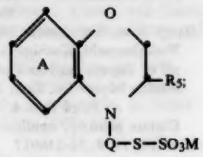
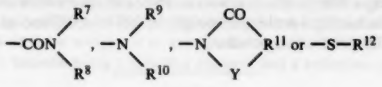


wherein R^2 is selected from hydrogen and the following groups: alkyl; cyclohexyl; cyclohexyl substituted with alkyl; and alkyl substituted with alkoxy, aryl, aryloxy, cyclohexyl, cyano, alkanoyloxy, alkoxycarbonyl, alkoxycarbonyloxy, aroyloxy, alkylcarbamoyloxy, arylcarbamoyloxy, or with a group having the formula



wherein

R^7 is hydrogen, alkyl or aryl;

R^8 is hydrogen or alkyl;

R^7 and R^8 collectively are $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R^9 is alkanoyl or aroyl;

R^{10} is hydrogen, alkyl, aryl or cyclohexyl;

R^{11} is ethylene, propylene, trimethylene, o-cyclohexylene, or o-arylene, or when Y is —CO—, R^{11} also can be $—NHCH_2—$, $—N(\text{lower alkyl})CH_2—$, $—SCH_2—$, $—OCH_2—$ or $—CH_2OCH_2—$;

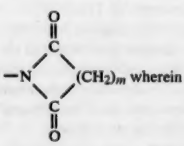
Y is $—CH_2—$, —CO—, or $—SO_2—$; and

R^{12} is aryl, benzyl, cyclohexyl, 1,2,4-triazol-3-yl, or 2-benzothiazolyl;

R^4 represents one or two substituents each of which is selected from hydrogen, halogen, cyano, alkyl, alkylsulfonyl, arylsulfonyl, arylthio, cyclohexylthio, alkoxy, aryloxy, 2-benzothiazolylthio, 2-thiazolylthio, 2-thiadiazolylthio, 2-oxadiazolylthio, 1,2,4-triazol-3-ylthio, 2-pyrimidinylthio, and such groups substituted with up to three of halogen, OH, aryl, CN, alkoxy, alkanoyl, aroylamino, alkylamino, alkanoyloxy, carbamoyl, alkylcarbamoyl, sulfamyl, alkylsulfonyl, succinimido, or alkoxycarbonyl groups;

each ring A of the couplers is unsubstituted or substituted with up to three substituents selected from alkyl, alkoxy, halogen, $NHSO_2$-alkyl, $NHCOR_1$ or such groups substituted with up to three of halogen, OH, aryl, CN, alkoxy, alkanoyl, aroylamino, alkylamino, alkanoyloxy, carbamoyl, alkylcarbamoyl, sulfamyl, alkylsulfonyl, succinimido, or alkoxycarbonyl groups, wherein R_1 is hydrogen, alkyl, alkoxy, alkylamino, aryl, cyclohexyl, furyl, cycloalkyl, or such groups substituted with up to three of halogen, OH, aryl, CN, alkoxy, alkanoyl, aroylamino, alkylamino, alkanoyloxy, carbamoyl, alkylcarbamoyl, sulfamyl, alkylsulfonyl, succinimido, or alkoxycarbonyl groups;

R_3 is selected from hydrogen; alkyl; alkyl substituted with alkoxy, alkoxyalkoxy, aryl, cycloalkyl, cyano, CONRR, SO_2NRR, SO_3M, aryloxy, cyclohexoxy,



2-pyrrolidono, furyl, alkylthio, or alkylsulfonyl wherein each

R is independently selected from hydrogen, alkyl, and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, or alkoxy; alkylcarbamoyl; alkenyl; aryl; cycloalkyl; and alkylcycloalkyl;

R_5 and R_6 are each independently selected from hydrogen, alkyl, and alkyl substituted with up to three of halogen, OH, aryl, CN, alkoxy, alkanoyl, aroylamino, alkylamino, alkanoyloxy, carbamoyl, alkylcarbamoyl, sulfamyl, alkylsulfonyl, succinimido, or alkoxycarbonyl groups;

Q is selected from alkylene of 2–8 carbons, alkylene of 2–8 carbons substituted by one to three groups selected from —OH, $—OCOCH_3$, $—C_6H_5$, and $—SO_3K$, and alkylene of 2–8 carbons which contain in its chain one to three groups selected from —O—, $—SO_2—$, —S—, $—N(SO_2CH_3)—$, $—N(COCH_3)—$, $—NHSO_2—$, $—N(CH_3)SO_2—$, $—SO_2NH—$, —NHCOO—, —NHCO—, —NHCONH—, and $—N(SO_2C_6H_5)—$; and M is H^+, Na^+, K^+, or NH_4^+.

4,324,720

LUBRICANT-BEARING FIBERS AND LUBRICANT COMPOSITIONS THEREFOR

Terence J. Swihart, Essexville, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 22, 1980, Ser. No. 189,494

Int. Cl.³ C08L *91/00*; D06M *13/18, 15/66*

U.S. Cl. 260—185 **12 Claims**

1. A composition consisting essentially of

(a) 1.0 part by weight of a silicone-glycol copolymer having the formula

$$(CH_3)_3SiO\{(CH_3)_2SiO\}_x\{(CH_3)(G)SiO\}_ySi(CH_3)_3$$

wherein

G denotes a silicon-bonded radical of the formula $—R-(OC_3H_6)_zOH$,

R denotes an alkylene radical containing from 1 to 18 carbon atoms,

x has an average value of from 40 to 90,

y has an average value of from 1 to 10, and

z has an average value of from 1 to 10, and

(b) from 1.0 to 9.0 parts by weight of butyl stearate.

4,324,721

1-(4-ALKYLAMINONAPHTHYLAZO)-4-NITROBENZENE DISPERSE DYES

Salvatore A. Bruno, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

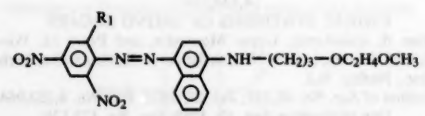
Continuation of Ser. No. 826,063, Aug. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 645,702, Dec. 31, 1975, Pat. No. 4,054,560, which is a continuation-in-part of Ser. No. 449,063, Mar. 7, 1974, abandoned. This application Jun. 4, 1979, Ser. No. 45,567

The portion of the term of this patent subsequent to Oct. 18, 1994, has been disclaimed.

Int. Cl.³ C07C *107/04*; C09B *29/095*

U.S. Cl. 260—196 **3 Claims**

1. The dye having the formula



wherein

R_1 is Br or Cl.

4,324,722

WATER-SOLUBLE SUBSTITUTED AMINOCARBONYL MONOAZO DYESTUFFS

Dieter vor der Brück, Bonn, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

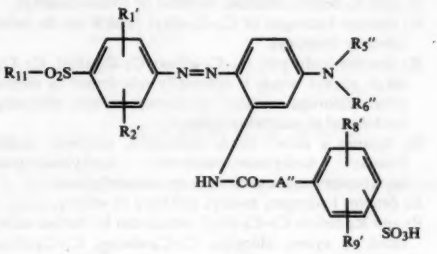
Continuation of Ser. No. 51,660, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 940,669, Sep. 8, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,375

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740846

Int. Cl.³ C07C *107/06*; C09B *29/18*

U.S. Cl. 260—207 **2 Claims**

1. Water-soluble monoazo dyestuff which in the form of the free acid corresponds to the formula



wherein

R_8' and R_9' denote hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, trifluoromethyl or cyano;

A″ denotes a direct bond, NH, $CH_2—O$, CH_2 or C_2H_4,

R_1' denotes hydrogen, chlorine, bromine or trifluoromethyl,

R_2' denotes hydrogen or chlorine,

R_5'' denotes methyl or ethyl,

R_6'' denotes methyl, ethyl or cyanoethyl, and

R_{11} denotes benzyl, phenyl which is optionally substituted by chlorine or methyl, or a radical of the formula

R_{12} denotes hydrogen or C_1–C_4-alkyl and

R_{13} denotes C_1–C_{12}-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, phenyl which is optionally substituted by methyl, ethyl, chlorine, methoxy or ethoxy, or benzyl, phenethyl, cyclohexyl or methylcyclohexyl.

4,324,723

MONOAZO DYESTUFFS

Dieter vor der Brück, Bonn, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

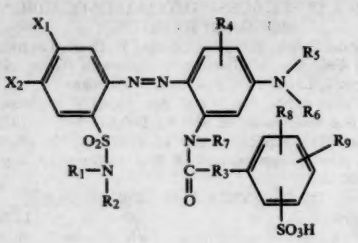
Filed Sep. 20, 1979, Ser. No. 77,501

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843475

Int. Cl.³ C07C *107/06*; C09B *29/085, 29/26*

U.S. Cl. 260—207.1 **2 Claims**

1. Monoazo dyestuffs which, in the form of the free acid, correspond to the formula



(I)

in which

X_1 and X_2 denote chlorine, bromine or trifluoromethyl,

R_1 denotes hydrogen or C_1–C_8-alkyl, which can be substituted by hydroxyl,

R_2 denotes hydrogen, C_1–C_4-alkoxy-C_1–C_4-alkyl, C_1–C_{13}-alkyl, phenyl which is optionally substituted by methyl, ethyl, chlorine, methoxy or ethoxy, benzyl, phenethyl, cyclohexyl or methylcyclohexyl,

R_3 denotes a direct bond, methylene, ethylene, methyleneoxy, methyleneoxycarbonyl, methyleneoxycarbonylamino, aminomethylene or aminoethylene,

R_4 denotes hydrogen, methyl, methoxy or ethoxy,

R_5 and R_6 denote C_1–C_4-alkyl, which can be further substituted by cyano, chlorine, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylcarbonyloxy or phenylaminocarbonyloxy, benzyl or phenethyl,

R_7 denotes hydrogen or C_1–C_4-alkyl, and R_8 and R_9 denote hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, trifluoromethyl or cyano.

4,324,724

MANUFACTURE OF POLYALKYLENEPOLYAMINES

Hans Mueller; Klaus Wulz, both of Ludwigshafen; Karl-Heinz Beyer, Frankenthal, and Werner Streit, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

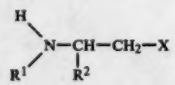
Filed Oct. 2, 1978, Ser. No. 947,585

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744982

Int. Cl.³ C07C *85/04, 85/02;* **C07D** *295/12, 203/12*

U.S. Cl. 260—239 E **5 Claims**

1. In a process for the manufacture of polyalkylenepolyamines wherein a primary or secondary amine is reacted with a compound of the formula



(I)

where X is —Cl, —Br or —OSO_3H and R^1 and R^2 are H or saturated alkyl of 1 to 4 carbon atoms in a molar ratio of at least 2 moles of I per mole of amine, and with at least the stoichiometric amount, based on the compound of the formula I of an alkali metal hydroxide or alkaline earth metal hydroxide, the improvement which comprises: carrying out the reaction at a temperature of from 60° to 200° C. and in the presence of an aqueous solution of the alkali metal hydroxide or alkaline earth metal hydroxide having a strength of from 15 to 45 percent, cooling the reaction mixture with continuous mixing to a temperature at which two aqueous phases form, and thereafter separating off the upper aqueous phase containing the polyalkylenepolyamines.

4,324,725

PREPARATION OF 5-(2,2-DIHALOVINYL)-4,4-DIALKYL-TETRAHYDROFURAN-2-ONES

Rudolf Kropp, Limburgerhof; Martin Fischer, Ludwigshafen, and Klaus Halbritter, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 178,177

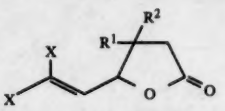
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937763

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ C07D *307/32*

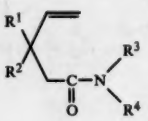
U.S. Cl. 260—343.6 **3 Claims**

1. A process for the preparation of a 5-(2,2-dihalovinyl)-4,4-dialkyl-tetrahydrofuran-2-one of the formula I



(I)

where R^1 and R^2 are each alkyl of 1 to 4 carbon atoms and X is halogen, wherein a carboxylic acid amide of the formula II

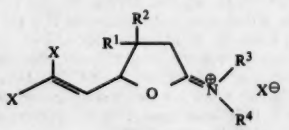


(II)

where R^1 and R^2 are each alkyl of 1 to 4 carbon atoms and R^3 and R^4 are each alkyl of 1 to 4 carbon atoms, aralkyl of 7 to 9 carbon atoms or aryl of 6 to 10 carbon atoms or together with the nitrogen on which they are present as substituents form a 5-membered or 6-membered saturated ring which may contain a further hetero-atom, is reacted with a carbon tetrahalide of the formula III

$$CX_4 \qquad \text{(III)}$$

where X is halogen, in the presence of an initiator and of an organic diluent or solvent, at from 120° to 160° C., to give an iminium salt of the formula IV



(IV)

where R^1, R^2, R^3, R^4 and X have the above meanings, and this iminium salt is subsequently hydrolyzed.

4,324,726

CHIRAL SYNTHESIS OF AMINO SUGARS

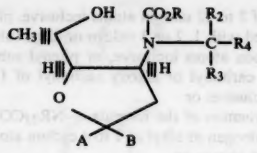
Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 60,261, Jul. 25, 1979, Pat. No. 4,252,964. This application Aug. 18, 1980, Ser. No. 179,126

Int. Cl.³ C07D *307/32*

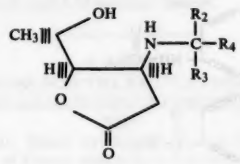
U.S. Cl. 260—343.6 **4 Claims**

1. A compound of the formula:



wherein B taken together with A forms oxo; R is lower alkyl; R_2 and R_4 are hydrogen, aryl, aralkyl, or lower alkyl and R_3 is aryl, or enantiomeric or racemic mixtures thereof.

3. A compound of the formula



wherein R_2 and R_4 are hydrogen, lower alkyl, aryl or aralkyl; and R_3 is aryl, or enantiomeric or racemic mixtures thereof.

4,324,727
PREPARATION OF BUTYROLACTONES

Franz Merger, Frankenthal, and Gerhard Nestler, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

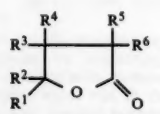
Filed Feb. 27, 1981, Ser. No. 238,980

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009604

Int. Cl.³ C07D *307/32*

U.S. Cl. 260—343.6 **2 Claims**

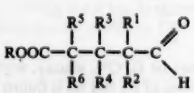
1. A process for the preparation of a butyrolactone of the formula



I

where R^1 is unsubstituted or substituted alkyl or phenyl and R^2 to R^6 are hydrogen or unsubstituted or substituted alkyl or phenyl, which comprises:

treating a γ-formylcarboxylic acid ester of the formula



II

where R is lower alkyl, with oxygen at an elevated temperature of 60°–150° C.

4,324,728
COMPOUND NANAOMYCIN A AND DERIVATIVES THEREOF AND A PROCESS FOR PRODUCING THE SAME

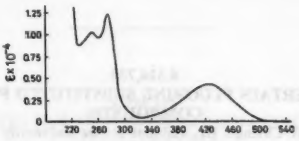
Satoshi Omura, Tokyo; Haruo Tanaka, Machida; Juichi Awaya, Souka, and Toju Hata, Tokyo, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Division of Ser. No. 858,215, Dec. 7, 1977, Pat. No. 4,196,266, which is a continuation of Ser. No. 719,744, Sep. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,563, Mar. 14, 1975, abandoned. This application Jun. 11, 1979, Ser. No. 47,451

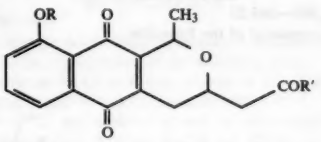
Claims priority, application Japan, Apr. 28, 1976, 51-49224

Int. Cl.³ C07D *311/92*

U.S. Cl. 260—345.2 **5 Claims**



1. New compounds represented by the following general formula:



wherein

(a) R=H, R′=OH and the compound has a specific rotation $[\alpha]_D^{26}$ −27.5° (C=1.0 in methanol)

(b) R=H, R′=NH_2 and the compound has a specific rotation $[\alpha]_D^{26}$ −2° (C=0.5 in dioxane)

(c) R=$COCH_3$, R′=OH and the compound has a specific rotation $[\alpha]_D^{22}$ +32.4° (C=1.02 in $CHCl_3$)

(d) R=H, R′=OCH_3 and the compound has a specific rotation $[\alpha]_D^{20}$ −21.7° (C=1.02 in $CHCl_3$)

4,324,729
NOVEL ACETYLENIC COMPOUNDS USEFUL AS STARTING MATERIALS FOR PREPARING AN ALICYCLIC KETONE

Peter Fankhauser, Onex, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

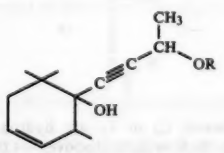
Filed Oct. 17, 1980, Ser. No. 198,250

Claims priority, application Switzerland, Oct. 24, 1979, 9526/79

Int. Cl.³ C07D *309/06*; C07C *35/18, 43/30*

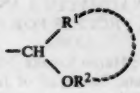
U.S. Cl. 260—345.9 R **1 Claim**

1. Compounds of formula



(I)

wherein symbol R represents a hydrogen atom, a trialkylsilyl radical or a group of formula



(II)

wherein, when taken separately, each of symbols R^1 and R^2 represents a lower alkyl radical or, when taken together, R^1 and R^2 represent a tetramethylene group.

4,324,730

CERTAIN FLUORINE SUBSTITUTED PGI_2 COMPOUNDS

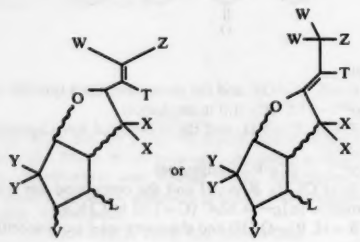
Josef Fried, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Continuation of Ser. No. 83,398, Oct. 10, 1979, abandoned, and a continuation of Ser. No. 108,525, Dec. 31, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,291

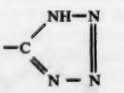
Int. Cl.³ C07D *307/935*

U.S. Cl. 260—346.22 20 Claims

1. A compound of the formulae:



wherein Y, T, W and X may each be H or F; provided that at least one of Y, T, W and X is F; V may be hydrogen, hydroxy, acyloxy, lower alkoxy, hydroxy lower alkyl, or oxo; Z may be $-Z_1-E$ wherein: Z_1 is $(CH_2)_g-CH_2-CH_2-$, or $-(CH_2)_g-O-CH_2-$, or $-(CH_2)_g-CH_2-CF_2-$, or trans-$(CH_2)_g-CH=CH-$; wherein g is 0, 1 or 2; and E is $-COOX_1$, wherein X_1 is hydrogen, alkyl, cycloalkyl, aralkyl, phenyl, phenyl substituted with chloro or alkyl, an alkali metal or an ammonium cation; or $-CH_2OH$; or



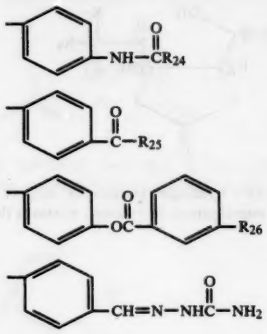
$-CH_2NL_2L_3$, wherein L_2 or L_3 are hydrogen, alkyl or $-COOX_1$ wherein X_1 is as defined above; $-COL_4$, wherein L_4 is,

(a) amino of the formula $-NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of 1 to 12 carbon atoms inclusive, aralkyl of 7 to 12 carbon atoms inclusive, phenyl, phenyl substituted with 1, 2 or 3 chloro or alkyl substituents of 1 to 3 carbon atoms inclusive, or phenyl substituted with hydroxy carbonyl or alkoxy carbonyl of 1 to 4 carbon atoms inclusive; or

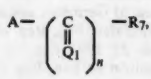
(b) carbonylamino of the formula, $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of 1 to 4 carbon atoms and R_{21} is as defined above; or

(c) sulfonylamino of the formula $-NR_{23}SO_2R_{21}$,

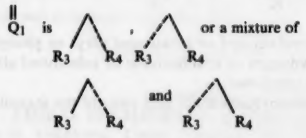
wherein R_{21} and R_{23} are as defined above; or $-COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of:



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{25} is methyl, phenyl, $-NH_2$, or methoxy; and R_{26} is hydrogen or acetamido; and L is

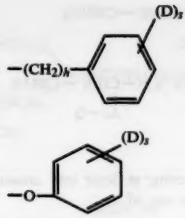


wherein n is 1 or 2; and A is trans—CH=CH—, or cis—CH=CH—, or $-CH_2-CH_2-$, or $-C\equiv C-$, or trans—CH=C(Halogen)—; and



wherein R_3 and R_4 may be H, OH, alkoxy, acyloxy, or fluoro with the proviso that one of R_3 and R_4 is fluoro only when the other is fluoro or hydrogen and when taken together R_3 and R_4 is oxo; and R_7 may be:

(a) $-(CH_2)_g-CH_3$, wherein g is 3, 4 or 5;



wherein h is 0, or 1; s is 0, 1, 2 or 3; and D is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two D's are other than alkyl and the 1,5- and 1,15-lactones thereof.

4,324,731

PROCESS FOR THE PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

Daniel Michelet, Tassin La Demi Lune, and Serge Veracini, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Nov. 7, 1980, Ser. No. 204,992

Claims priority, application France, Dec. 7, 1979, 79 30645

Int. Cl.³ C07D *307/86*

U.S. Cl. 260—346.22 **14 Claims**

1. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran by heating orthomethallylpyrocatechol, which comprises heating ortho-methallylpyrocatechol in the presence of an aluminium derivative of the formula

in which R_1, R_2 and R_3, which are identical or different, each represent an organic radical.

4,324,732

PROCESS FOR THE PREPARATION OF MONOAROYLATED 1,4-DIAMINOANTHRAQUINONES

Norbert Majer, Berg.-Gladb., and Günther Boehmke, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,569

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937876

Int. Cl.³ C07C *143/665*

U.S. Cl. 260—377 **8 Claims**

1. In a process for the preparation of monoaroylated 1,4-diaminoanthraquinone by contacting 1,4-diaminoanthraquinone with an aroyl halide in the presence of an organic solvent and an acid-binding agent and in the presence of a small amount of water at an elevated temperature, the improvement which comprises carrying out the process in the presence of a tertiary aliphatic aminoalcohol and/or quaternary ammonium compound by heating a reaction mixture comprising 1,4-diaminoanthraquinone, organic solvent, acid binding agent, a small amount of water and said tertiary aliphatic aminoalcohol and/or quaternary ammonium compound up to a temperature of 20° to 50° C., adding aroyl halide thereto and completing the reaction at a temperature of 80° to 130° C.

4,324,733

Patent Not Issued For This Number

(b)

4,324,734

DE-EMULSIFIER

Stephen J. Rehm, Tulsa, and Young R. Lee, Broken Arrow, both of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 27, 1980, Ser. No. 200,733

Int. Cl.³ C07F *9/02*; C08H *3/00*

U.S. Cl. 260—403 **12 Claims**

1. The method of forming a polyester which is strongly lipophilic by,

combining a polyol whose lipophilic portion has a high molecular weight with a polybasic acid and with a non-oxidative reactive acidic phosphorus derivative catalyst, and heating the solution to a high viscosity.

4,324,735

METHOD FOR WINTERIZING (DEWAXING) OF VEGETABLE OILS

Karl W. H. Sarebjörk, Tumba, and Anders B. Pallmar, Tullinge, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Jul. 2, 1980, Ser. No. 164,535

Claims priority, application Sweden, Jul. 9, 1979, 7905963

Int. Cl.³ C11B *3/06*

U.S. Cl. 260—425 **7 Claims**

1. A method for winterizing (dewaxing) vegetable oils characterized by the combination of the following steps:

(a) neutralizng the oil to a soap content of 100–7000 ppm;

(b) chilling of said oil to a temperature below 15° C., preferably 5–15° C. and addition to said oil of an alkali corresponding to 0.01– 0.06 kgs NaOH per 100 kgs oil;

(c) addition to said oil of 3–10 kgs water per 100 kgs oil with intense agitation;

(d) separation of the mixture so obtained into one heavy fraction containing water- lye- soap- waxes- other high melting matters and a lighter fraction consisting of the winterized (dewaxed) oil.

4,324,736

TETRAVALENT VANADIUM COMPOUNDS WHICH ARE SOLUBLE IN ORGANIC SOLVENTS

Walter Josten, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Noble Aktiengesellschaft, Cologne, Fed. Rep. of Germany

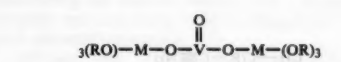
Filed Aug. 21, 1980, Ser. No. 179,586

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934277

Int. Cl.³ C07F *9/00*

U.S. Cl. 260—429 R **11 Claims**

1. A compound of tetravalent vanadium of the general formula



wherein M represents a metal of the fourth group of the Periodic Table of the Elements and R represents an alkyl, cycloalkyl or aryl moiety of 1 to 20 carbon atoms.

4,324,737

PROCESS FOR THE PREPARATION OF ORGANOSTANNIC TRIHALIDES

Michel Foure, Artix, France, assignor to Societe Nationale Elf Aquitaine, France

Filed May 20, 1980, Ser. No. 151,642
Claims priority, application France, May 23, 1979, 79 13108
Int. Cl.[3] C07F 7/22
U.S. Cl. 260—429.7 10 Claims

1. A process of preparing organostannic trihalides obtained by the action of a stannous compound on an olefin compound activated by a carbonyl group adjacent to the carbon-carbon double bond in the presence of a hydracid, characterized by the fact that the reaction medium is free of solvent but contains an excess of olefin, said excess being at least 0.5 mol per mol of stannous compound.

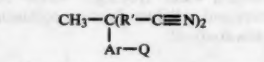
4,324,738

DINITRILES AND THEIR PREPARATION

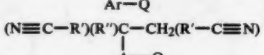
Charles A. Drake, and Stanley D. Turk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 716,406, Aug. 23, 1976, Pat. No. 4,288,625, which is a continuation of Ser. No. 499,660, Aug. 22, 1974, abandoned. This application Apr. 9, 1980, Ser. No. 138,942
Int. Cl.[3] C07C 121/66, 121/70, 121/75, 121/78
U.S. Cl. 260—465 H 21 Claims

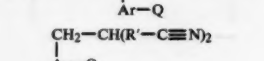
1. As compositions of matter, aralkylenedinitriles represented by:



(I)

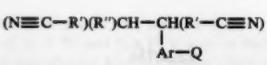


(II)



(III)

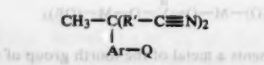
and



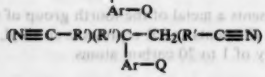
(IV)

wherein each R′ is an alkylene or alkylidene radical of at least one carbon atom with one valence attached to the cyano group, R′ is an alkyl radical of at least one carbon atom, and Ar is a divalent phenylene or naphthylene radical wherein Q is selected from the group consisting of —H, —X, —R‴, —N(R‴)$_2$, —NH$_2$.HX, —SH, —OH, and —SR‴, wherein X is halogen and is fluorine, chlorine, bromine, or iodine, and R‴ is an alkyl radical of 1 to 6 carbon atoms.

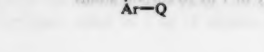
10. A process for the preparation of aralkylenedinitriles represented by



(I)



(II)



(III)

and

(IV)

which comprises reacting at least one unsaturated dinitrile represented by at least one of

(V)

and

(VI)

with at least one aromatic compound represented by H—Ar—Q in the presence of a Lewis Acid compound as catalyst under reaction conversion conditions;

wherein each R′ is an alkylene or alkylidene radical of at least one carbon atom with one valence attached to the cyano group, R″ is an alkyl radical of at least one carbon atom, and Ar is a divalent phenylene or naphthylene radical wherein Q is selected from the group consisting of —H, —X, —R‴, —N(R‴)$_2$, —NH$_2$. HX, —SH, —OH, and —SR‴, wherein X is halogen and is fluorine, chlorine, bromine, or iodine, and R‴ is an alkyl radical of 1 to 6 carbon atoms.

4,324,739

DIMETHYLAMINO DERIVATIVES AND THEIR USE

Helmut Zondler, Bottmingen, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,800
Claims priority, application Switzerland, Apr. 10, 1979, 3405/79
Int. Cl.[3] C07C 121/417, 121/46, 121/52, 121/66
U.S. Cl. 260—465.4 2 Claims

1. A compound of the formula

$(CH_3)_2N—X—NR^{10}CONHR^9$

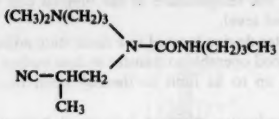
wherein

X is ethylene, 1,3-propylene or 1,3-propylene substituted in the 1- or 2-position by methyl,

R^9 is alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aryl of 6 to 12 carbon atoms, alkaryl of 7 to 16 carbon atoms or alkaralkyl of 8 to 16 carbon atoms, and

R^{10} is β-cyanoethyl or β-cyanoethyl substituted in the 1- or 2-position by methyl.

2. A compound according to claim 1 which is



4,324,740

PREPARATION OF 2-PHENYLETHYLENE PHOSPHONIC ACID

Meffert Alfred, and Holger Tesmann, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,394

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010471

Int. Cl.³ C07F 9/38

U.S. Cl. 260—502.4 R 1 Claim

1. In a process for preparing 2-phenylethylene phosphonic acid by reacting styrene and PCl_5 in an inert organic solvent and hydrolyzing the reaction product formed,

the improvement which comprises forming a mixture of styrene and PCl_5 in a molar ratio of about 1:1 at a temperature of from 60° to 70° C. in an inert organic solvent having a boiling point above 70° C.; maintaining the mixture under agitation at a temperature of from 60° to 70° C. with evolution of HCl gas until a clear solution forms; distilling off the solvent under vacuum; hydrolyzing the remaining reaction mixture in water at temperatures not exceeding 70° C. and cooling the hydrolyzed mixture to cause crystals of 2-phenylene phosphonic acid to precipitate; and recovering said crystals.

4,324,741

PERFLUOROALKYL COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Teruo Umemoto, Sagamihara, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

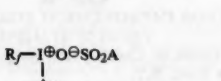
Filed Jun. 6, 1980, Ser. No. 156,951

Claims priority, application Japan, Jun. 6, 1979, 54/69979

Int. Cl.³ C07C 143/24; A61K 31/185

U.S. Cl. 260—505 R 2 Claims

1. Perfluoroalkyl compounds represented by the formula (I):



(I)

wherein R_f represents a perfluoroalkyl group having 1 to 20 carbon atoms, Ar represents a substituted or unsubstituted phenyl group wherein the substituent is an alkyl group having 1 to 4 carbon atoms or a halogen atom, I represents an iodine atom, and A represents a perfluoroalkyl group having 1 to 20 carbon atoms which can be the same as or different from R_f or, an alkyl group having 1 to 4 carbon atoms or an aryl group.

4,324,742

PROCESS FOR SEPARATION OF NAPHTHALENEDISULFONIC ACIDS

Hironory Fujii; Thuyoshi Nagashima, and Nobuyori Shibamoto, all of Wakayama, Japan, assignors to Sugai Chemical Industry Co., Ltd., Wakayama, Japan

Continuation-in-part of Ser. No. 48,247, Jun. 13, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 180,895

Claims priority, application Japan, Jun. 15, 1978, 53-72622

Int. Cl.³ C07C 143/24

U.S. Cl. 260—505 C 10 Claims

1. A process for separating 2,6-naphthalenedisulfonic acid from a reaction mixture resulting from the disulfonation of naphthalene, which comprise the steps of:

(a) disulfonating naphthalene under β,β-disulfonation reaction conditions in order to obtain a reaction mixture containing predominantly 2,6-naphthalenedisulfonic acid and 2,7-naphthalenedisulfonic acid therein;

(b) adding water to said reaction mixture obtained by said disulfonation of naphthalene in order to adjust to 50 to 70% by weight the sulfuric acid concentration in said reaction mixture;

(c) maintaining the reaction mixture at a temperature of 0° to 70° C.; and

(d) separating away precipitated crystals of 2,6-naphthalenedisulfonic acid.

4. A process for separating 1,6-naphthalenedisulfonic acid from a reaction mixture resulting from the disulfonation of naphthalene, which comprises the steps of:

(a) disulfonating naphthalene under α,β-disulfonation reaction conditions, in order to obtain a reaction mixture containing predominantly 1,6-naphthalenedisulfonic acid and 1,7-naphthalenedisulfonic acid and minor amounts of 2,6- and 2,7-naphthalenedisulfonic acids;

(b) adding water to said reaction mixture obtained by disulfonation of naphthalene in order to adjust to 35 to 90% by weight of sulfuric acid concentration in said reaction mixture;

(c) maintaining said reaction mixture at a temperature of 0° to 80° C.; and

(d) separating away precipitated crystals of 1,6-naphthalenedisulfonic acid.

8. A process for separating 2,7-naphthalenedisulfonic acid from a reaction mixture resulting from the disulfonation of naphthalene, which comprises the steps of:

(a) disulfonating naphthalene under β,β-disulfonation reaction conditions in order to obtain a resulting reaction mixture containing predominantly 2,6-naphthalenedisulfonic acid and 2,7-naphthalenedisulfonic acid therein;

(b) adding water to said reaction mixture obtained by said disulfonation of naphthalene in order to adjust to 35 to 45% by weight the sulfuric acid concentration within said reaction mixture;

(c) maintaining said reaction mixture at a temperature of 0° to 50° C.; and

(d) separating away precipitated crystals of 2,7-naphthalenedisulfonic acid.

4,324,743

METHOD OF PREPARING GAMMA-L-GLUTAMYL TAURINE

Laszlo Feuer; Arpad Furka; Ferenc Sebestyen; Jolan Hercsel nee Szepespataky, and Erzsebet Bendefy nee Dobay, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation of Ser. No. 571,766, Apr. 25, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,726

Claims priority, application Hungary, Apr. 29, 1974, FE 928; Mar. 26, 1975, CI 1558

Int. Cl.³ C07C 143/02

U.S. Cl. 260—513 N 3 Claims

1. A method of preparing gamma-L-glutamyl taurine which comprises the steps of:

(a) reacting carbobenzyloxy-L-glutaminic acid-α-benzyl ester with a substantially equivalent quantity of triethylamine and a substantially equimolar quantity of isobutylchloroformate, then stirring the reaction mixture with cystamine dihydrochloride, and recovering N,N'-bis-(N-carbobenzyloxygamma-L-glutamyl)-cystamine;

(b) treating the N,N'-bis-(N-carbobenzyloxygamma-L-glutamyl)-cystamine obtained in step (a) with hydrogen peroxide in lacial acetic acid to produce carbobenzyloxy-gamma-(α-benzyl)-L-glutamyl-taurine;

(c) dissolving the carbobenzyloxy-gamma-(α-benzyl)-L-glutamyl-taurine obtained in step (b) in an alkali hydroxide solu-

tion, treating an ion-exchange resin with the resulting solution, eluting said treated resin with water and evaporating the eluate to produce carbobenzyl-gamma-L-glutamyl-taurine; and

(d) subjecting the carbobenzyloxy-gamma-L-glutamyl-taurine to acidolysis to produce gamma-L-glutamyl-taurine.

4,324,744

ACYLPHOSPHINE OXIDE COMPOUNDS

Peter Lechtken, Frankenthal; Ingolf Buethe, Mannheim, and Anton Hesse, Luetzelsachsen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

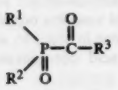
Continuation of Ser. No. 55,360, Jul. 6, 1979, abandoned. This application May 9, 1980, Ser. No. 148,221

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830927

Int. Cl.³ C07F *9/30, 9/38, 9/53*

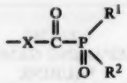
U.S. Cl. 260—932 **3 Claims**

1. An acylphosphine oxide compound of the formula



(I)

where R^1 is straight-chain or branched alkyl of 1 to 6 carbon atoms, cyclohexyl, cyclopentyl, phenyl or naphthyl which are unsubstituted or substituted by halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms, a pyridyl or thienyl radical, R^2 has one of the meanings of R^1 or is alkoxy of 1 to 6 carbon atoms, phenoxy, methylphenoxy, benzyloxy or vinyloxy, or R^1 and R^2 may be joined together to form a five- or six-membered P-containing ring, and R^3 is straight-chain or branched alkyl of 2 to 18 carbon atoms, a cyclopropyl, cyclobutyl, cyclopentyl, 1-methylcyclopentyl, cyclohexyl, 1-methylcyclohexyl, norbornadienyl, adamantyl, vinyl, methylvinyl, naphthyl radical, phenyl or naphthyl which are substituted by alkyl of 1 to 8 carbon atoms or by thioalkoxy of 1 to 6 carbon atoms, a naphthyl which is substituted by alkoxy of 1 to 6 carbon atoms, a pyridyl or thienyl radical, and may contain additional functional groups, or is the group



where R^1 and R^2 have the above meanings and X is phenylene or butane-1,4-diyl with the proviso that R^1 is not t-butyl or benzyl if R^3 stands for t-butyl or n-butyl.

4,324,745

DEVICE FOR AUTOMATICALLY REGULATING A CHOKE VALVE IN A CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

Yasuaki Kono, Aichi, and Hisaharu Arai, Nagoya, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Japan

Filed Jul. 14, 1980, Ser. No. 168,699

Claims priority, application Japan, Oct. 6, 1979, 54-129262

Int. Cl.³ G05D *23/00*

U.S. Cl. 261—39 E **1 Claim**

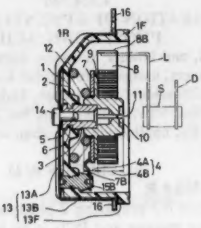
1. A device for automatically regulating a choke valve mounted for variable movement across the air/fuel induction passage in a carburetor of an internal combustion engine, said device comprising:

a housing fixed to the body of the carburetor,

a bimetal coil provided in said housing and operably connected to the choke valve shaft urging the choke towards a closed position with a force increasing as a function of decreases in the temperature of the bimetal coil from a predetermined level,

an electric heater device located in a fixed state adjacent to said bimetal coil operable to transfer its heat output to said bimetal coil up to its limit to thereby open the choke valve,

and a heat conductive member interposed between said bimetal coil and said electric heater device



wherein each surface of said heat conductive member is kept in contact with said heater device and the bimetal coil operable to transfer the heat output from said heater device to said bimetal coil by direct heat conduction, said bimetal coil being formed in a conical shape and mounted on a bimetal coil retainer and operable to press said heat conductive member with its compressive spring force.

4,324,746

CARBURETOR IMPROVEMENT FOR PART THROTTLE VACUUM STAGING

William A. Green, St. Charles, Mo., assignor to ACF Industries, Inc., New York, N.Y.

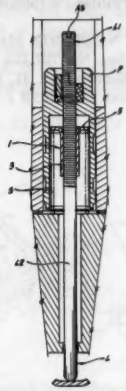
Filed Nov. 26, 1980, Ser. No. 210,724

Int. Cl.³ F02M *7/20*

U.S. Cl. 261—51 **2 Claims**

1. In a carburetor for an internal combustion engine, the carburetor having a fuel metering rod, a throttle shaft, a cam carried on the throttle shaft, a cam follower movable by the cam, a metering rod lifter contacted by the cam follower for moving the metering rod as the throttle shaft rotates, a step-up piston mounted on the lifter and responsive to engine vacuum for moving the lifter and the metering rod when a change in engine vacuum occurs while the throttle shaft is stationary, the position of the step-up piston on the lifter being adjustable for part throttle carburetor operation, and a step-up spring normally bearing against the step-up piston to exert a force on the piston which balances the force exerted thereon by engine vacuum, the improvement comprising spring seating means attachable to the metering rod lifter, the spring seating means including a sleeve sized to fit over the metering rod lifter, one end of the sleeve being flared outwardly to form a circumferential seat against which the step-up spring bears, the step-up spring bearing against the circumferential seat rather than the step-up piston whereby part throttle adjustment of the step-up

piston position on the metering rod lifter does not alter the step-up spring force from that which the step-up spring is



designed to exert when changes in engine vacuum occur and the throttle shaft is stationary.

4,324,747

PULP WASTE LIQUOR-PHENOLIC RESIN BINDER

Krishan K. Sudan, Ste-Therese, and Antoine Berchem, St. Hippolyte, both of Canada, assignors to Reichhold Limited, Ontario, Canada

Filed Apr. 4, 1980, Ser. No. 137,501

Claims priority, application United Kingdom, Feb. 20, 1979, 13914/79

Int. Cl.[3] **C08G** *8/28;* **C08H** *5/02;* **C08J** *3/12;* **B01J** *2/02*

U.S. Cl. 264—13 **17 Claims**

1. A process for preparing a modified phenol-formaldehyde resin which consists essentially of admixing at ambient temperature an aqueous phenol-formaldehyde resin with paper or board mill pulping process waste block kraft liquor in a weight ratio of from 1:10 to 10:1 based upon the solids content of both the aqueous resin and the waste liquor, the mixing being effected under conditions such that there is substantially no reaction between the aqueous resin and the black kraft liquor.

4,324,748

PROCESS AND APPARATUS FOR EXTRUDING PLASTIC FOAMS THROUGH A FLUOROCARBON LINED DIE SHAPING MEANS HAVING EXTENDED WEAR CHARACTERISTICS

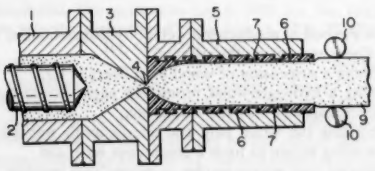
Hideo Hatakeyama, Hiratsuka, and Toru Yamamoto, Kanuma, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 60,664, Jul. 25, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,944

Claims priority, application Japan, Jul. 28, 1978, 53-92183

Int. Cl.[3] **B29D** *27/00;* **B29C** *1/04*

U.S. Cl. 264—51 **11 Claims**



1. In a method for producing plastic foam by extruding a melt of a thermoplastic synthetic resin containing a blowing agent through an extrusion die on the end of an extruder, and forming and solidifying it by passing it through a shaping device having a metallic body secured to the discharge end of the extruder and extending away from said die in the direction of extrusion on the extruder opening into the inlet of the shaping device, the improvement comprising providing a plate of a fluorocarbon resin on at least a part of the inside surfaces of the metallic body, one of said body and said plate having recesses therein and the other of said body and said plate having projections thereon interfitted with said recesses, the inner surfaces of said recesses and the exterior surfaces of said projections being spaced from each other when the plate is unheated, said spaces being sufficiently large to just accommodate the resin plate at the temperature of extrusion from the heat of the resin for causing said projections to fit in said recesses for holding said plate securely on said shaping device.

4,324,749

THREE-DIMENSIONAL EXCHANGE ELEMENT FOR LIQUID GUIDANCE IN LIQUID-GAS CONTACT SYSTEMS

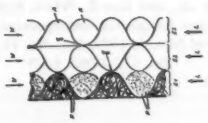
Jürgen Bronner, Wuppertal, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 915,412, Jun. 14, 1978, abandoned. This application Jun. 18, 1980, Ser. No. 160,671

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 2726723

Int. Cl.[3] **F28C** *1/02*

U.S. Cl. 261—112 **2 Claims**



1. In a liquid-gas contact system wherein said liquid-gas comprises a vertical tower which contains a heat exchange unit through which water flows countercurrently or cross-currently to a stream of gas flowing therethrough, the improvement of said a heat exchange unit comprising a plurality of 3-dimensional, mutually supporting exchange elements arranged side-by-side, in contact with each adjacent element and each of said elements comprising randomly intersecting synthetic filaments having a diameter of about 0.1 to 2.5 mm, fused at their points of intersection, wherein said filaments form a self-supporting planar web with a density of from 5 to 10 kg per cubic meter and having hump-like projections of a substantially identical height of from about 20 to about 70 mm at regular intervals on the face of said planar web, said projections comprising contact surfaces for adjacent elements of like construction, wherein said elements are positioned parallel to each other and in contact with an adjacent element at said projections.

4,324,750

METHOD FOR MAKING HIGH K PLZT CERAMIC CAPACITOR

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 2,837, Jan. 12, 1979, Pat. No. 4,219,866, which is a continuation-in-part of Ser. No. 802,160, May 31, 1977, Pat. No. 4,135,224, which is a continuation-in-part of Ser. No. 619,089, Oct. 2, 1975, Pat. No. 4,027,209. This application Aug. 18, 1980, Ser. No. 178,669
Int. Cl.³ C04B 35/49
U.S. Cl. 264—61 9 Claims

1. A method for making a PLZT ceramic capacitor comprising:

(a) forming a powder blend consisting essentially of precursors of a single antiferroelectric compound of lead-barium-lanthanum-zirconate-titanate doped with silver and bismuth;

(b) calcining said blend in a closed container at a peak temperature of less than 1130° C. to form said antiferroelectric compound;

(c) pulverizing said calcined compound;

(d) forming a body of said pulverized compound;

(e) sintering said body in a closed container;

(f) annealing said sintered body in an open atmosphere at less than 1000° C. to drive out the free lead oxide residing in said body; and

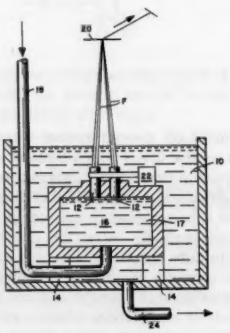
(g) forming two spaced electrodes in contact with said body.

4,324,751

PROCESS FOR PREPARING VISCOSE RAYON

Charles J. Geyer, Jr., and Ben E. White, both of Berwyn, Pa., assignors to Fiber Associates, Incorporated, Berwyn, Pa.

Filed Nov. 5, 1979, Ser. No. 91,147
Int. Cl.³ B06B 3/00
U.S. Cl. 264—23 3 Claims



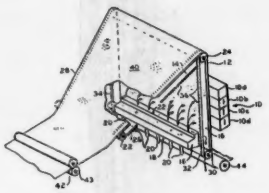
1. A process for removing particle and gel impurities from a jet for spinning viscose rayon filaments which comprise directly contacting said jet with a source of ultrasonic sound of vibrations of at least 20,000 hz so as to remove said impurities by vibration from said jet without altering the filament structure.

4,324,752

PROCESS FOR PRODUCING A FUSED FABRIC

Richard C. Newton, and Gerald A. Romanek, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 905,072, May 11, 1978, abandoned, which is a division of Ser. No. 797,213, May 16, 1977, Pat. No. 4,105,484. This application Dec. 31, 1979, Ser. No. 108,440
Int. Cl.³ H05B 1/00
U.S. Cl. 264—25 12 Claims



1. A process for the controlled fusing of at least a portion of the synthetic thermoplastic fibers in an unfused fabric, having a first and second surface, to produce a fused fabric having a uniform appearance and a soft hand, said process comprising the steps of:

exposing a portion of the first surface of said unfused fabric to infrared radiation to thereby fuse at least a portion of said synthetic thermoplastic fibers together; and

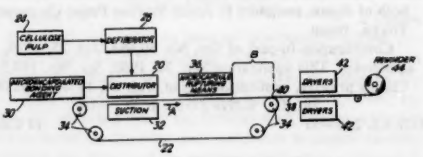
directing a fluid towards a portion of the second surface of said unfused fabric, which is directly opposite the portion of the first surface of said unfused fabric which is exposed to said infrared radiation, in such a manner that at least a portion of said fluid passes completely through said unfused fabric so as to prevent overfusing of said synthetic thermoplastic fibers by said infrared radiation, the exposing of a portion of the first surface of said unfused fabric to said infrared radiation occurring simultaneously with the directing of said fluid towards the portion of the second surface of said unfused fabric.

4,324,753

METHOD OF PRODUCING AN AIR LAID PAPER WEB UTILIZING MICROENCAPSULATED HYDROGEN BOND PROMOTING MATERIAL

Robert A. Gill, 7452 Red Coat Dr., Hamilton, Ohio 45011

Filed Nov. 3, 1980, Ser. No. 203,070
Int. Cl.³ B27J 5/00
U.S. Cl. 264—121 12 Claims



1. A method of producing a web of hydrogen-bonded wood pulp fibers comprising the steps of:

forming a suspension of wood pulp fibers in air;

mixing a hydrogen-bond promoting agent in the form of microcapsules into said suspension;

depositing the wood pulp and microcapsule mixture on a moving screen to form a continuous web; and

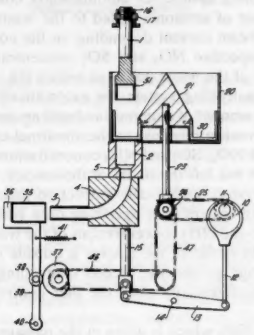
rupturing said microcapsules to release said bonding agent so that hydrogen-bonds are formed between said wood pulp fibers within said web.

4,324,754

METHOD OF INSERTING A POWDER IN THE MANUFACTURE OF ELECTRICAL DRY CELLS

Edward G. Stephenson, Tyne and Wear, and Tom Taylor, Newcastle-upon-Tyne, both of England, assignors to Crompton Parkinson Limited, Leeds, England

Filed Jul. 6, 1979, Ser. No. 55,142
Claims priority, application United Kingdom, Jul. 13, 1978, 29768/78
Int. Cl.³ B28B 1/24
U.S. Cl. 264—268 4 Claims



1. A method for filling a container having an open mouth and a bottom, with a slug of powdery material, for subsequently forming an electrical dry cell, comprising:

(a) feeding from a reservoir said powdery material into a cylinder having an inlet connected to a passage having a downstream restriction, followed by an exit nozzle,

(b) moving a reciprocating ram during a first part of the stroke towards said inlet to consolidate said powdery material and to urge said powdery material against said restriction,

(c) effecting relative movement between the nozzle and the container until said exit nozzle is adjacent the bottom of said container, and

(d) extruding a slug of said powdery material from said exit nozzle into said container, during a second part of the stroke of said ram while progressively separating said container from said exit nozzle at a rate wherein the rate of increase of available volume in the container as it moves relative to the nozzle does not exceed the rate of extrusion of said slug from said exit nozzle, to thereby fill said container with said powdery material by a single stroke of said ram as said container is so relatively moved.

4,324,755

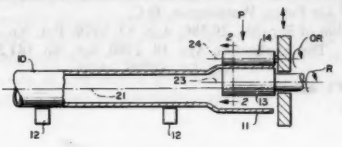
PROCESS FOR PUTTING A LIP ON A THICK-WALLED TUBE OF FLEXIBLE MATERIAL, AND APPARATUS FOR PRACTICING SAME

Raymond Bommer, La Forteresse, France, assignor to Cabinet Patco, Paris, France

Continuation-in-part of Ser. No. 96,510, Nov. 21, 1979, abandoned, which is a continuation of Ser. No. 849,422, Nov. 7, 1977, abandoned. This application Sep. 5, 1980, Ser. No. 184,364
Claims priority, application France, Nov. 5, 1976, 76 33363
Int. Cl.³ B28B 1/46
U.S. Cl. 264—312 10 Claims

1. A procedure for flaring thick-walled tubes of flexible plastic material, of the type in which the said flaring is accomplished cold, wherein, in order to obtain a preferred and permanent orientation of the molecules of the plastic material, avoiding any shrinkage after flaring, the said flaring is obtained by means of the step of rolling at room temperature with the step being effected by an outer roller and an inner roller, and with both rollers and the tube rotating simultaneously, and further by the step of reducing friction to the maximum extent possible.

4. A device for flaring thick-walled tubes of flexible plastic material wherein the structure making the said flaring possible comprises only two mandrels applied to both sides of the wall



constituting the said tube, by one mandrel inside of said tube having its axis offset from the axis of the pipe to be flared and the other mandrel outside of said tube and with said mandrels exerting a radial pressure with respect to the said wall, and with both of said mandrels being maintained at room temperature.

4,324,756

PROCESS FOR SHAPING SOLID POLYBUT-1-ENE AND THE RESULTING SHAPED ARTICLES

Andre Kepes, Le Vesinet; Eric Weynant, Golfe Juan; Pierre Avenas, Sceaux, and Jean-Marc Haudin, Antibes, all of France, assignors to Societe Chimique des Charbonnages-CdF CHIMIE, Bully-les-Mines, France

Filed Oct. 18, 1979, Ser. No. 85,949
Claims priority, application France, Oct. 30, 1978, 78 30701
Int. Cl.³ B29B 1/00, 3/00
U.S. Cl. 264—322 12 Claims

1. A process for shaping solid polybut-1-ene, comprising preheating polybut-1-ene in the crystalline form II at a temperature between 20° and 90° C. and then press-forging it under a pressure between 8 and 100 kgf/mm² for a period of 1 to 40 seconds into a desired shape.

4,324,757

HALOGENATED HYDROCARBONS INHIBITED AGAINST DENICKELIFICATION WITH LOWER ALKYLCYANIDE COMPOUNDS

John B. Ivy, and Ted S. Boozalis, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1979, Ser. No. 53,671
Int. Cl.³ F28F 19/00; C23F 11/14
U.S. Cl. 422—7 11 Claims

1. A method of inhibiting the denickelification of a nickel alloy in contact with a halogenated aliphatic hydrocarbon having from 1 to 10 carbon atoms and from 1 to 10 halogen atoms capable of causing denickelification of the nickel alloy comprising maintaining a lower alkylcyanide compound having from 1 to 6 carbon atoms in the alkyl group capable of inhibiting denickelification of the nickel alloy dissolved in the halogenated aliphatic hydrocarbon in an amount sufficient to inhibit denickelification of the nickel alloy.

11. In a heat recovery and transfer system employing a halogenated aliphatic hydrocarbon having from 1 to 10 carbon atoms and from 1 to 10 halogen atoms or a mixture of such halogenated aliphatic hydrocarbons in contact with a nickel alloy under conditions capable of causing denickelification of the nickel alloy, the improvement comprising maintaining methylcyanide dissolved in the halogenated aliphatic hydrocarbon in an amount sufficient to inhibit denickelification of the nickel alloy.

4,324,758

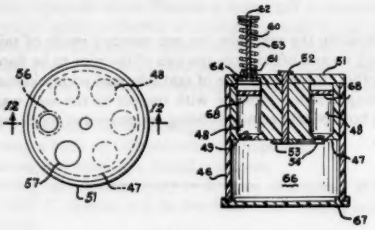
ANALYSIS OF LUBRICATING OILS FOR IRON CONTENT

Kent J. Eisentraut, Xenia; William D. Ross, Eaton; William J. Hillan, Kettering; Joseph J. Brooks, Centerville, all of Ohio, and Thomas G. Duffy, Jacksonville, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 29,586, Apr. 12, 1979, Pat. No. 4,238,197. This application Apr. 18, 1980, Ser. No. 141,500

Int. Cl.³ G01N *33/28*

U.S. Cl. 422—61 **2 Claims**



1. Apparatus for use in determining the amount of iron present in a used lubricating oil which comprises a reaction chamber having upper and lower ends; a closure member formed of a rubbery material adapted to close the lower end of the reaction chamber; a solid body member non-rotatably attached to the upper end of the reaction chamber, the said body member having a plurality of cavities formed therein with each of the cavities having a lower opening therein communicating the cavity with the reaction chamber; a rotatable top member having an opening therein positioned on the body member and rotatable relative thereto; and means for sequentially positioning an opening in the rotatable top member so that it is in vertical alignment with one of said plurality of cavities in the body member.

4,324,759

APPARATUS FOR TREATING WASTE GAS BY IRRADIATION WITH ELECTRON BEAMS

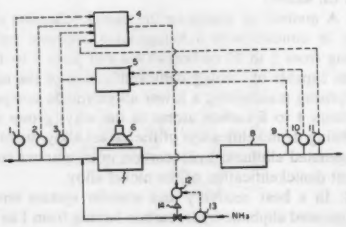
Shinji Aoki, Tokyo; Ryuichi Ishikawa, Yokohama, and Yasuhiro Sawada, Fuchu, all of Japan, assignors to Ebara Corp and Japan Iron and Steel Federation, both of Tokyo, Japan

Filed May 19, 1980, Ser. No. 150,941

Claims priority, application Japan, Jul. 11, 1979, 54/87578

Int. Cl.³ B01D *53/34;* **B01J** *12/02, 19/08;* **F23J** *15/00*

U.S. Cl. 422—62 **5 Claims**



1. An apparatus for treating waste gas containing nitrogen oxides (NO_x) and sulfur dioxide (SO_2) by irradiation with electron beams and with the addition of ammonia (NH_3), which apparatus comprises:

a reactor having a gas inlet through which the untreated waste gas is introduced, a window through which electron beams are irradiated and a gas outlet through which the irradiated gas is delivered;

a dust collector having a gas inlet which is connected to the gas outlet of said reactor and a gas outlet through which the gas purified by the dust collector passes;

an electron beam accelerator which generates electron beams which pass through the window of the reactor and are absorbed by the waste gas in the reactor;

means for adding ammonia to said waste gas;

means for measuring the concentration of NO_x and SO_2 and the flow rate of the waste gas;

first controlling system for automatically controlling both the amount of ammonia added to the waste gas and the electron beam current depending on the normal changes of the respective NO_x and SO_2 concentrations and the flow rate of the waste gas at or before the reactor inlet;

a second controlling system for automatically controlling both said amount of ammonia and said amount of electron beam current in response to the abnormal changes of the respective NO_x, SO_2 and NH_3 concentrations of the waste gas which has left the outlet of the reactor;

a judging system which can instruct to make the second controlling system start operating only when any of the NO_x, SO_2 and NH_3 concentrations of the waste gas which has left the outlet of the reactor is outside of a predetermined range so that the second controlling system may operate preferentially over the first controlling system; and

an inlet for NH_3 which is given in the passage of the waste gas lying between (1) the point where said means for measuring the concentration of NO_x and SO_2 and the flow rate of the waste gas are installed and; (2) the inlet of said dust collector, characterized in that said second controlling system can operate according to the instructions from said judging system only when at least one of the concentrations of NO_x, SO_2 and NH_3 of the waste gas in the downstream of the outlet of the reactor is outside of the predetermined range.

4,324,760

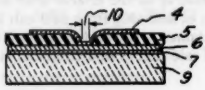
HYDROGEN DETECTOR

Lawrence A. Harris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,791

Int. Cl.³ G01N *31/06, 27/40, 27/12*

U.S. Cl. 422—98 **12 Claims**



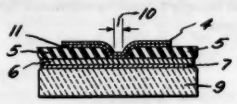
1. A hydrogen detector comprised of a substrate supporting an electrically conducting base metal film, an electrically conducting top film of metal able to dissociate hydrogen into atomic form, a polycrystalline film of titanium dioxide sandwiched between the base and top films, said polycrystalline titanium dioxide film electrically insulating the base film from said top film, the base film being in electrical contact with the titanium dioxide film, an insulating layer electrically insulating said titanium dioxide film from said top film except for a predetermined surface portion thereof in electrical contact with said top film, said predetermined electrically contacting portion being at least sufficiently large to produce a measurable electrical conductance, said top and base films being electrically connected to an external circuit to measure conductance, the electrical conductance of said hydrogen detector varying with the concentration of hydrogen in the atmosphere surrounding it.

4,324,761

HYDROGEN DETECTOR

Lawrence A. Harris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,790
Int. Cl.[3] G01N *27/40, 27/12, 31/06*
U.S. Cl. 422—98 20 Claims



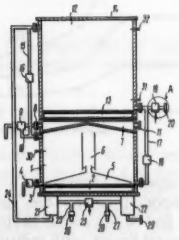
1. A hydrogen detector comprised of a substrate supporting an electrically conducting base metal film, an upper electrically conducting diffusion barrier metal film, a polycrystalline film of titanium dioxide sandwiched between the base and diffusion barrier films, said polycrystalline titanium dioxide film electrically insulating the base film from said diffusion barrier film, the base film being in electrical contact with the titanium dioxide film, an insulating layer electrically insulating said titanium dioxide film from said diffusion barrier film except for a predetermined surface portion thereof in electrical contact with said diffusion barrier film, said predetermined electrically contacting portion being at least sufficiently large to produce a measurable electrical conductance, an electrically conducting or non-conducting catalytic top film of metal able to dissociate hydrogen into its atomic form in electrical contact with said diffusion barrier film and at least substantially coextensive with said barrier film throughout said predetermined electrically contacting portion, said top film when it is electrically conducting or said diffusion barrier film and said base film being electrically connected to an external circuit to measure conductance, the electrical conductance of said hydrogen detector varying with the concentration of hydrogen in the atmosphere surrounding it.

4,324,762

APPARATUS FOR STERILIZATION BY STEAM OF FERMENTATION OBJECTS

Jury V. Redikultsev, mikroraion "G", dom 19, kv. 133; Leonid A. Litvinenko, mikroraion "AB", dom 8,kv. 74; Svetlana B. Petrikevich, mikroraion "V", dom 30, kv. 54; Taisia S. Chermenskay, mikroraion "G", dom 7, kv. 67; David S. Vershkov, mikroraion "AB", dom 6, kv. 33; Boris F. Nesterov, mikroraion "V", dom 24, kv. 62, and Irina V. Bogoroditskaya, mikroraion "AB", dom 6, kv. 41, all of Puschino Moskovskoi oblasti, U.S.S.R.

Filed Mar. 7, 1980, Ser. No. 128,366
Claims priority, application U.S.S.R., Jul. 3, 1979, 2777125
Int. Cl.[3] G05D *9/00;* C01B *6/10;* C12M *1/12*
U.S. Cl. 422—106 5 Claims



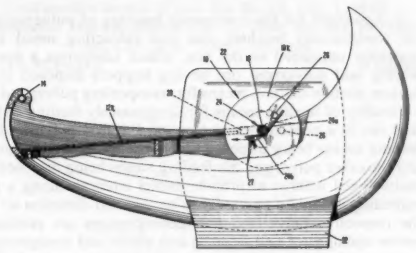
1. Apparatus for sterilization by steam of fermentation objects, comprising: a closed sterilization vessel; a first heater mounted on one wall within said sterilization vessel; a condenser mounted on the wall within said sterilization vessel opposite to said one wall; an inlet to said sterilization vessel; a closed buffer vessel; a second heater mounted on a wall within said buffer vessel; lines communicating said buffer vessel with said sterilization vessel; valve means in said lines; at least two gas filters mounted on said first heater; a steam flow rate regulator having an input and an output, the input thereof being connected to one side of the first one of said gas filters and the output thereof being connected to one side of the second one of said gas filters; said first gas filter having its other side communicating with said buffer vessel; a gas outlet pipe connected to the other side of said second gas filter, and a sterile medium outlet pipe connected to said buffer vessel.

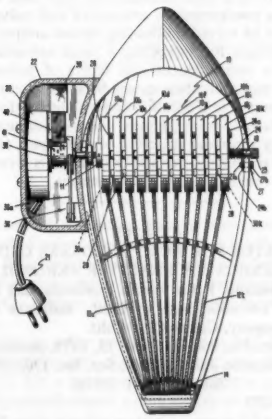
4,324,763

INCENSE BURNING APPARATUS

James C. Jarman, 3610 Gramby St., Landover, Md. 20784

Filed Apr. 23, 1981, Ser. No. 256,826
Int. Cl.[3] A61L *9/03*
U.S. Cl. 422—116 17 Claims





1. An apparatus for successively igniting a plurality of incense sticks, comprising:

an igniter member;

means for supporting said plurality of incense sticks spaced apart from said igniter member;

means for rotating said incense sticks successively and sequentially into contact with said igniter member; and

means for energizing said igniter member during contact with said incense sticks to sequentially ignite said sticks.

4,324,764

APPARATUS FOR CONTINUOUS LEACHING OF ORES

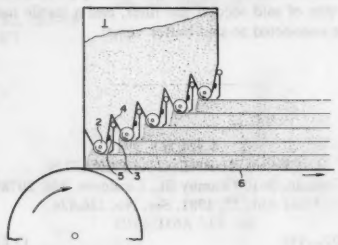
Shoichi Hasegawa, Tokyo; Thoru Yamashita, Yokohama, and Mitsuo Kameda, Tokyo, all of Japan, assignors to International Resources Company, Ltd., Tokyo, Japan

Division of Ser. No. 935,501, Aug. 21, 1978, Pat. No. 4,225,563. This application Jul. 23, 1980, Ser. No. 171,394

Claims priority, application Japan, Sep. 9, 1977, 52/108488

Int. Cl.³ B01D *11/02;* **B01J** *4/00, 8/02;* **C22B** *3/02*

U.S. Cl. 422—159 **6 Claims**



1. Apparatus for the continuous leaching of pulverized ore for continuously leaching out and extracting metal component(s) contained in the ore, which comprises a bin for storing said pulverized ore having hoppers disposed in the bottom portion thereof, means for transporting pulverized ore, a plurality of feeding means for continuously feeding pulverized ore in a predetermined amount, the first pulverized ore feeding means being disposed above the transportation means and the other pulverized ore feeding means being disposed in a multi-staged manner at predetermined intervals along a path extending gradually upwardly in an inclined direction so that the respective pulverized ore feeding means are positioned below openings of said hoppers and above said transportation means, said plurality of feeding means being operable to form on said transportation means multi-staged, continuous, adjacent unit layers of a uniform thickness, each unit layer being composed of a predetermined amount of said pulverized ore, and a plurality of solvent sprinkling means cooperating with said feeding means for sprinkling a metal-extracting solvent between every two adjacent unit layers of pulverized ore, there being a said sprinkling means between every two adjacent feeding means at a location immediately before the two adjacent unit layers formed thereby come in contact with each other, whereby a laminar structure of unit layers of a uniform mixture of the pulverized ore and the solvent is formed continuously on the moving transportation means.

4,324,765

APPARATUS FOR PUMPING GASES USING A CHEMICALLY REACTIVE AEROSOL

Frithjof N. Mastrup, Palos Verdes Peninsula, and Leonard J. Marabella, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 960,681, Nov. 13, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,434

Int. Cl.³ B01D *50/00*

U.S. Cl. 422—173 **5 Claims**

1. Apparatus for pumping certain exhaust gases from a container therefor by converting said gases into solids by chemically reacting said gases with a chosen highly reactive substance in the form of aerosol particles, and to thereby generate a partial vacuum surrounding said solids, and provide said pumping of said exhaust gases, which comprises:

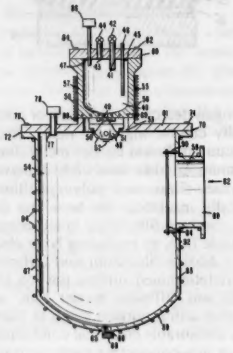
(a) a chamber having first and second openings therein;

(b) means adjacent said first opening of said chamber for providing the influx of said exhaust gases from said container into said chamber through said first opening in said chamber,

(c) an antechamber adjacent said second opening of said chamber, to contain said reactive substance in solid form and having first and second openings therein;

(d) means adjacent said antechamber for heating said antechamber to raise the temperature therein sufficiently to liquefy said solid;

(e) means associated with said first opening of said antechamber and said second opening of said chamber, for dispersing said liquefied reactive substance into said aerosol particles; and



(f) means associated with said second opening of said antechamber for applying a chosen inert gas to said liquefied reactive substance under pressure sufficient to cause said substance to flow through said dispersing means to form said aerosol particles and to inject said aerosol particles into said chamber through said second opening in said chamber.

4,324,766

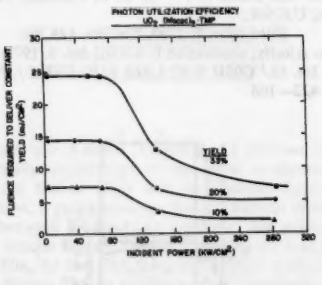
METHOD OF SEPARATING ISOTOPES OF URANIUM EMPLOYING $UO_2(HFACAC)_2.L$ WITH AN IMPROVED PHOTON EFFICIENCY

Richard B. Hall, Clark, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 12, 1979, Ser. No. 75,155

Int. Cl.³ B01D *59/00*

U.S. Cl. 423—3 **3 Claims**



1. A method of separating isotopes of U including the step of irradiating a compound having the general formula $UO_2AA'.L$, where A and A′ are anions having a total net charge of 2, and L is a neutral ligand, with radiation of a wavelength, λ, at which said $UO_2AA'.L$ has a predetermined absorption cross section $\sigma\lambda$ at a power >120 kw/cm² times

$$\sigma\lambda/4\times10^{18}\ \text{cm}^2,$$

thereby increasing photon efficiency due to localized energy dissociating the molecule before the energy equilabrates throughout the molecule.

4,324,767

SEPARATION PROCESS UTILIZING MICROCAPSULES

Martin B. Dines, Santa Ana, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 4, 1980, Ser. No. 175,161
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—3 **29 Claims**

28. A process for removing ionic uranium in the +4 valence state from an aqueous solution which comprises:

(a) contacting said aqueous solution with a microcapsule having a polymeric wall surrounding an aqueous solution containing a reagent selected from the group consisting of Fe^{+3}, I_2 and quinone, said wall being substantially insoluble in said fluid and said ionic uranium in the +4 valence state being permeable to said wall;

(b) permeating ionic uranium in the +4 valence state through said wall into said aqueous solution;

(c) converting said ionic uranium in the +4 valence state in said aqueous solution to ionic uranium in the +6 valence state and which is impermeable to said wall;

(d) separating said microcapsules from said aqueous solution;

(e) converting the ionic uranium in the +6 valence state into permeable ionic uranium in the +4 valence state; and

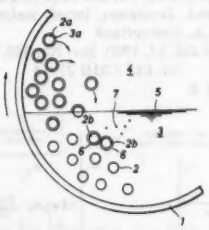
(f) permeating the ionic uranium in the +4 valence state through said wall.

4,324,768

PROCESS FOR PREPARATION OF LEAD COMPOUNDS

Yujiro Sugahara, Tokyo; Hiroyuki Naito, Tsuruoka; Mamoru Saito, Tsuruoka; Takashi Mori, Tsuruoka, and Toshio Honma, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kozyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 958,490, Nov. 7, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 217,084
Claims priority, application Japan, Nov. 12, 1977, 52-135908
Int. Cl.³ C01G *21/14;* C04B *31/02;* C07F *7/24*
U.S. Cl. 423—92 **8 Claims**



1. A process for the preparation of water insoluble lead compounds having a composition represented by the following general formula

$$nPbO.PbX_{2/x}$$

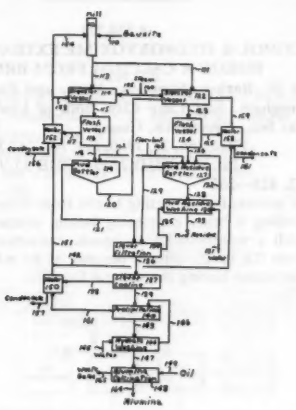
wherein X stands for an inorganic acid or organic acid radical, x indicates the valency of the radical X and n is a number of from 0 to 5, which comprises reacting a lead monoxide with an acidic component which is a corresponding inorganic acid, its acidic oxide, a corresponding organic acid or an acid anhydride of said organic acid of an acetic acid or of an acetic acid or in the presence of no more than a catalytic amount of an acetic acid, wherein the lead monoxide is a lead monoxide containing a higher lead oxide selected from the group consisting of lead dioxide and minimum in an amount of 0.001 to 5% by weight based on the total weight and being obtained by charging granules of metallic lead, an aqueous liquid medium and oxygen in a rotary mill, rotating the rotary mill under such conditions that at least parts of the metallic lead granules wetted with the liquid medium are located in the gas phase above the level of the liquid medium and friction is caused among the metallic granules through the liquid medium, to thereby form a dispersion of very fine particles of lead monoxide in the liquid medium and separating the dispersion from the metallic lead granules, and wherein the lead monoxide in the form of the as-prepared dispersion is mixed with said acidic component in the presence of 0.001 to 5% by weight, based on the lead monoxide, of an acid addition salt of hydroxylamine with a nonoxidizing acid under such conditions that the initial pH value of the mixture is maintained at a level not higher than 7, said acid addition salt being present in an amount sufficient to reduce most or all the lead dioxide or minimum in the starting lead monoxide.

4,324,769

EXTRACTION AND PRODUCTION OF ALUMINA CONTAINING LESS THAN 0.03 PERCENT IRON OXIDE

James W. McDaniel, Baton Rouge, La., assignor to Alumina Development Corporation, Baton Rouge, La.

Continuation-in-part of Ser. No. 80,183, Oct. 1, 1979, abandoned. This application Oct. 22, 1980, Ser. No. 199,135
Int. Cl.³ C01F *7/06, 7/20, 7/34*
U.S. Cl. 423—121 **6 Claims**



1. A process for extracting from an ore containing alumina wherein said alumina is predominantly in the form of alumina trihydrate, but also wherein said alumina is at least about 5% in the form of alumina monohydrate, the extracted alumina having an Fe_2O_3 content of less than 0.03% by weight, which comprises:

(a) digesting in a first reaction vessel at 100°–230° C. a mixture of spent caustic aluminate liquor, and a first portion of said ore for a period of time sufficient to form a first supersaturated caustic aluminate liquor stream and a mud stream,

(b) separating said aluminate liquor stream from said mud stream,

(c) digesting in a second reaction vessel at a temperature greater than in said first reaction zone but between 200°–300° C. a second portion of said ore, said mud stream, and spent caustic aluminate liquor for a period of time sufficient to form a second supersaturated caustic aluminate stream and a second mud stream, wherein the alumina to caustic weight ratio is between 0.58–0.8, and said mud stream to said second portion of said ore weight ratio is between 0.1 to 2.5,

(d) separating said second aluminate stream from said second mud stream,

(e) combining said first and second aluminate streams in a third reaction vessel with diluted spent caustic aluminate liquor and alumina hydrate seeding to precipitate out alumina hydrate, and

(f) calcining said alumina hydrate to form said alumina.

4,324,770

PROCESS FOR DRY SCRUBBING OF FLUE GAS

Even Bakke, Stamford, Conn., assignor to Peabody Process Systems, Inc., Stamford, Conn.

Filed Sep. 22, 1980, Ser. No. 189,026
Int. Cl.[3] C01B *17/00*
U.S. Cl. 423—242 7 Claims

1. In a process for removing sulfur dioxide from flue gas including the steps of feeding the sulfur dioxide-containing flue gas to a spray dryer, contacting the flue gas with an atomized solution of alkali reactant in a spray zone in a spray drying chamber to form sulfite and sulfate reaction products, spray drying the solution and formed materials in the spray drying chamber to obtain dry particles, conveying the flue gas and dry particles to a dry particle collector and removing the dry particles in the dry particle collector, the improvement therein comprising recycling a portion of the dry particles removed in the dry particle collector and contacting the sulfur dioxide containing-flue gas directly with the dry recycled portion of particles.

4,324,771

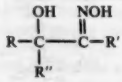
ALCOHOL & HYDROXYOXIME EXTRACTANT FOR BORON & CALCIUM FROM BRINES

Ernest W. Barlow, Stansbury Park, and Ramaswami Neelameggham, Salt Lake City, both of Utah, assignors to Amax Inc., Greenwich, Conn.

Filed Jun. 23, 1980, Ser. No. 162,335
Int. Cl.[3] B01D *11/01;* C01B *35/10*
U.S. Cl. 423—283 8 Claims

1. A process for extracting boron from brines, comprising:

providing a brine containing boron, contacting the brine with a water-insoluble organic extractant consisting of from 0.8 to 15 volume percent of an α-hydroxy oxime extractant having the general formula:



where R and R′ are hydrocarbon radicals and R″ is selected from the group consisting of hydrogen and organic hydrocarbon radicals, from 0 to 10 volume percent of a 7 to 12 carbon alcohol, balance essentially diluent to said brine to extract boron from the brine.

4,324,772

PROCESS FOR PRODUCING HYDROXYAPATITE

James F. Conn, and Leofwin A. Jessen, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1980, Ser. No. 208,224
Int. Cl.[3] C01B *25/32*
U.S. Cl. 423—309 10 Claims

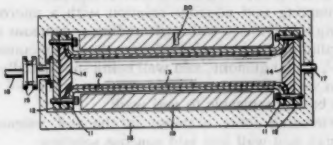
1. A process for producing hydroxyapatite comprising continuously charging to the first stage of a two-stage reactor a slurry of calcium oxide in water and a solution of phosphoric acid in water, allowing said slurry and said solution to react in said first stage under vigorous agitation at a pH such that the viscosity of the reaction mass is near minimum viscosity, continuing said reaction in the second stage of said reactor under vigorous agitation while continuously charging additional solution of aqueous phosphoric acid thereto in an amount sufficient to maintain the pH in said second stage at about 7.0 to about 7.4 and continuously removing a suspension of hydroxyapatite from said second stage.

4,324,773

HYDROTHERMAL PROCESS AND APPARATUS FOR SYNTHESIZING CRYSTALLINE POWDERS

Bruce H. Chai, Bridgewater; Ernest Buehler, Chatham, and John J. Flynn, Millington, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 30, 1981, Ser. No. 230,077
Int. Cl.[3] C01B *25/36*
U.S. Cl. 423—311 12 Claims



1. A process for preparing crystalline powders of alpha-aluminum orthophosphate or alpha-gallium orthophosphate comprising the sequential steps of:

(a) heating a sealed pressure vessel containing a mixture comprising a compound selected from the group consisting of aluminum hydroxide, aluminum oxide, and gallium sesquioxide and an excess of concentrated phosphoric acid to a first temperature between about 180° C. and about 235° C.,

(b) cooling the vessel to a second temperature between about 125° C. and about 150° C.,

(c) repeating steps (a) and (b) at least one more time,

(d) rapidly cooling the vessel from the first temperature, to near ambient temperature, and

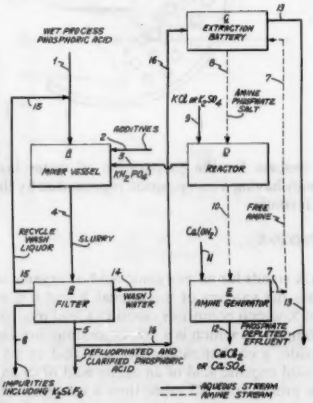
(e) recovering the resultant crystalline powder.

4,324,774

METHOD FOR THE MANUFACTURE OF DEFLUORINATED PHOSPHATIC PRODUCTS

Avraham M. Baniel, Jerusalem, Israel, assignor to Fertilizer Development S.A., Switzerland

Filed Jul. 17, 1980, Ser. No. 169,765
Int. Cl.[3] C01B *25/16*
U.S. Cl. 423—321 R 11 Claims



1. A method for removal of fluorine from wet-process phosphoric acid (WPA) prepared by acidulation of phosphate rock

with sulfuric acid comprising reacting wet-process phosphoric acid with KH_2PO_4 in a first unit to precipitate fluorine present in said wet-process phosphoric acid as potassium fluosilicate and produce clarified and substantially fluorine-free phosphoric acid, wherein said KH_2PO_4 is formed in-situ by reacting in a second unit (i) an amine phosphate salt with (ii) a potassium salt selected from the group consisting of KCl and K_2SO_4, and wherein said amine phosphate salt is formed in a third unit by reaction of (i) an amine which is present in a water-immiscible liquid system comprised of members selected from the group consisting of a primary, secondary, tertiary aliphatic amine, a quaternary ammonium base or mixtures thereof, said amine and/or quaternary ammonium base comprising at least two aliphatic hydrophobic groups each containing at least 7 carbon atoms directly attached to the nitrogen thereof, with (ii) a stoichiometric equivalent amount of a portion of the clarified and substantially fluorine-free phosphoric acid produced in said first unit.

4,324,775

PROCESS FOR RECOVERING SULFUR BY REMOVAL OF SULFUR DIOXIDE FROM GASEOUS MIXTURES

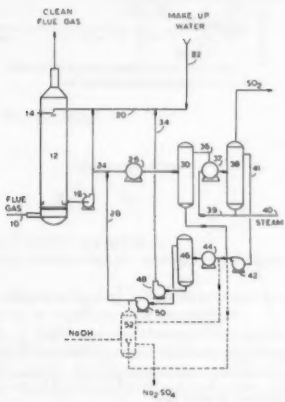
Shao E. Tung, 91 Blake Rd., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 838,913, Oct. 3, 1977, Pat. No. 4,211,761, which is a continuation-in-part of Ser. No. 728,174, Sep. 30, 1976, Pat. No. 4,101,643, which is a continuation-in-part of Ser. No. 499,582, Aug. 22, 1974, Pat. No. 3,084,529. This application Mar. 10, 1980, Ser. No. 129,079

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[3] **C01B** *17/48, 17/00, 17/04*

U.S. Cl. 423—539 **17 Claims**



1. A process for removing SO_2 from a gaseous mixture comprising:

contacting the gaseous mixture in a scrubbing zone with a scrubbing liquid comprising an aqueous solution of at least one alkali metal scrubbing salt having the formula M_2B, where M^+ is a monovalent alkali metal cation, and $B^=$ is a divalent anion, said salt being derived from a weak acid having pKa value which is at least 3.0 to yield a pregnant, spent aqueous scrubbing solution containing an alkali metal hydrosulfite salt and a second compound containing a proton and an anion derived from such scrubbing salt;

contacting, in a transfer reaction zone, the pregnant, spent scrubbing solution with an organic liquid phase which contains a transfer reactant, which phase and reactant do not form stable emulsions with water, said transfer reactant being an amine acid salt containing a cationic group derived from at least one amine functional group selected from the class $—NH_2$, $>NH$, $>N—$ and $—N—^+$, and said cationic group further containing a hydrophobic subgroup containing from about 8 to about 45 carbon atoms, said amine salt further containing a monovalent, proton-containing acidic anion, $—HB^-$, having a monovalent cation moiety containing said amine functional group and hydrophobic subgroup attached thereto, said acidic anion being derived from another anion containing one less proton than said monovalent acidic anion, which other anion is derived from a weak acid having a pKa value greater than 3.0, said amine salt having a solubility in water of less than about 5 gms/100 gms of water at 25° C. to yield, by an ion transfer reaction, a post-transfer reaction organic liquid phase containing a sulfur containing amine acid salt yielded by the transfer reaction, and a post-transfer reaction aqueous phase containing either a compound containing the same anion, $—HB^-$, as said amine salt or said scrubbing salt;

heating the post-transfer reaction organic liquid phase to decompose the sulfur-containing amine salt to yield sulfur dioxide and to reduce the acidity of the amine phase; and

contacting the acidity-reduced amine phase with said post-transfer reaction aqueous phase to yield, by a regeneration reaction, an organic phase which contains regenerated amine acid salt transfer reactant and an aqueous phase containing regenerated alkali metal scrubbing salt.

4,324,776

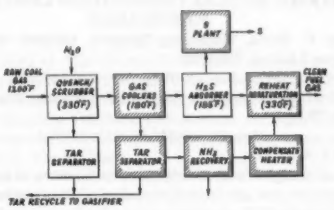
MID-TEMPERATURE H_2S REMOVAL PROCESS

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,161

Int. Cl.[3] **B01D** *53/34;* **C01C** *1/242*

U.S. Cl. 423—550 **18 Claims**



1. A process for removing hydrogen sulfide from a gaseous stream comprising the steps of:

(a) providing an aqueous solution at a pH of between 2 and 12, said solution containing at least one reactive metal compound therein the metal of which is selected from the group consisting of nickel, iron and zinc;

(b) removing hydrogen sulfide from said gaseous stream by contacting the same with said aqueous solution at a temperature of between 300° and 400° F. in a closed vessel to form a resulting solution having a metal sulfide reaction product therein and a resulting gaseous stream depleted in hydrogen sulfide;

(c) removing said resulting gaseous stream from said contact;

(d) regenerating said reactive metal compound provided in the aqueous solution in step (a) from said metal sulfide reaction product by aerating at least a portion of said resulting solution with an oxygen-containing gas while maintaining the pH level of said resulting solution at between approximately 2 to 12.

4,324,777

MATERIAL AND METHOD TO DISSOCIATE WATER AT CONTROLLED RATES

Eugene R. Anderson, 601 Highland, Wills Point, Tex. 75169

Continuation-in-part of Ser. No. 68,749, Aug. 23, 1979, and a continuation-in-part of Ser. No. 902,705, May 4, 1978, Pat. No. 4,207,095, and a continuation-in-part of Ser. No. 902,708, May 4, 1978, Pat. No. 4,182,748. This application Oct. 16, 1979, Ser. No. 85,374

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.³ C01B *1/07, 13/02*

U.S. Cl. 423—579 29 Claims

1. A material for the generation of hydrogen and oxygen from water at controlled rates, comprising: an amalgam of an alkali metal, mercury and aluminum wherein the atomic weight ratio of alkali metal to mercury is from about 3:1 to about 1:1.5 and the atomic weight ratio of alkali metal to aluminum is from about 1:1 to about 3:1; a catalytic alloy of platinum and at least one element selected from the group consisting of germanium, antimony, gallium, thallium, indium, cadmium, bismuth, lead, zinc and tin; and an extender metal comprising at least one metal selected from the group consisting of silver, copper, thallium, titanium, magnesium, molybdenum, tungsten, cadmium, nickel, rhodium, iron, palladium, cobalt, chromium, tin, iridium, lead, gallium, vanadium, gold, antimony, zirconium and bismuth, said extender metal comprising from about 0.1 wt. % to about 97.3 wt. % of the total combination of amalgam, catalytic alloy and extender metal.

4,324,778

PHARMACEUTICAL COMPOSITION CONTAINING PARCETAMOL

Adrian F. Davis, Hounslow, England, assignor to Beecham Group Limited, England

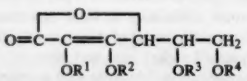
Filed Jan. 29, 1980, Ser. No. 116,538

Claims priority, application United Kingdom, Jan. 31, 1979, 03420/79

Int. Cl.³ A61U *31/165, 31/365*

U.S. Cl. 424—10 10 Claims

1. An analgesic and antipyretic pharmaceutical composition adapted for oral administration, which comprises paracetamol and an amount of ascorbate anion bioprecursor which ascorbate ion precursor is a derivative of ascorbic acid of the formula (II):



(II)

in which R^1, R^2, R^3 and R^4, which may be the same or different, are each hydrogen or an alkyl group of 10 to 20 carbon atoms, R^1, R^2, R^3 and R^4 not all being hydrogen simultaneously, sufficient, on oral administration of said composition, to reduce the potential liver toxicity effects of the paracetamol content of said composition, said ascorbate anion bioprecursor being absorbable from the gastro-intestinal tract to produce higher and/or more prolonged ascorbate anion concentrations in the liver after oral administration of mole equivalent amounts of ascorbic acid itself, the weight ratio of ascorbate bioprecursor to paracetamol calculated as ascorbic acid equivalents being from 1:4 to 3:1.

4,324,779

METHOD FOR TREATING HYPERTONIA WITH N-(2-FURFURYL)-4-CHLORO-5-SULFAMOYL-ANTHRANILIC ACID AND PREPARATIONS THEREOF

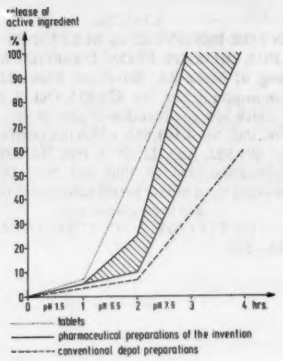
Gebhard Dahlhausen, Kronberg; Hans-Werner Dibbern; Fülberth, both of Kelkheim, and Gerhard Ross, Kriftel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

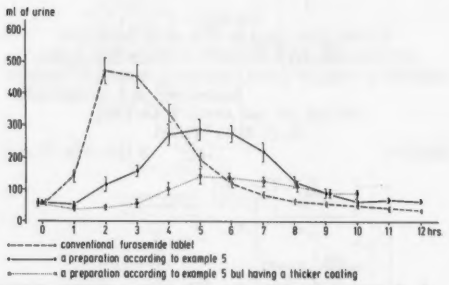
Continuation of Ser. No. 749,993, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 650,594, Jan. 20, 1976, abandoned, which is a continuation of Ser. No. 500,285, Aug. 26, 1974, abandoned. This application Sep. 20, 1979, Ser. No. 77,181

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1973, 2343218

Int. Cl.³ A61K *9/22, 9/32*

U.S. Cl. 424—20 1 Claim





1. A furosemide-containing pellet for the oral administration of furosemide, said pellet consisting essentially of a core of furosemide having thereover a sustained-release coating which starts to dissolve in a weakly acid medium, which coating, when its release characteristics are measured in vitro in a flow-through-cell according to Dibbern,

(a) releases not more than 5 percent of said furosemide into a buffer solution having a pH of 1.5 during the first hour of measurement in said cell;

(b) releases about 10 to at most 25 percent of said furosemide into a buffer solution having a pH of 5.5 during the second hour of measurement in said cell; and

(c) releases the remainder of said furosemide substantially completely into a buffer solution having a pH of 7.5 during the third and fourth hours of measurement in said cell.

4,324,780

COPOLYMERS, PROCESS FOR PREPARING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Bernard Jacquet, Antony; Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, all of France, assignors to L'Oreal, Paris, France

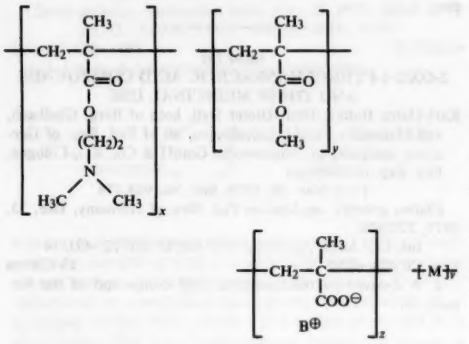
Division of Ser. No. 897,435, Apr. 18, 1978, Pat. No. 4,237,253. This application Jun. 25, 1980, Ser. No. 162,927

Claims priority, application France, Apr. 21, 1977, 77 12048; Mar. 14, 1978, 78 07308

Int. Cl.³ A61K *7/00, 7/06*

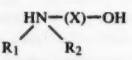
U.S. Cl. 424—47 **7 Claims**

1. A cosmetic composition comprising in an appropriate cosmetic vehicle from 0.5–10 percent by weight of at least one copolymer having the formula



wherein

B represents Na, K, NH_4,



or 2-amino-2-methyl propanol-1;

R_1 and R_2 each independently represent hydrogen or —X—OH;

X represents alkylene having 1–3 carbon atoms or alkylene substituted by at least one hydroxymethyl;

M represents at least one unsaturated monomer selected from the group consisting of acrylamide substituted on the nitrogen by alkyl, methacrylamide, substituted on the nitrogen by alkyl, acrylate or monoalkyl ether of ethylene glycol, acrylate of monoalkyl ether of polyethylene glycol, methacrylate of monoalkyl ether of ethylene glycol, methacrylate of monoalkyl ether of polyethylene glycol and N-vinyl pyrrolidone;

x is 22–64 mole percent;

y is 13–17 mole percent;

z is 6–23 mole percent;

v is 0–22 mole percent; and

x+y+z+v is equal to 100 mole percent.

4,324,781

PESTICIDAL AQUEOUS SUSPENSION

Yukikazu Okamoto, Ikeda, and Manabu Tagami, Takarazuka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 10, 1979, Ser. No. 74,371

Claims priority, application Japan, Sep. 8, 1978, 53/110942

Int. Cl.³ A01N *37/00, 43/08, 47/10, 61/02*

U.S. Cl. 424—78 **9 Claims**

1. A pesticidal aqueous suspension having excellent dispersion stability, which comprises, based on the total weight of the suspension, (a) as a pesticidally active ingredient, about 10 to 50 wt% of an N-methyl- or N-phenylcarbamate which is solid and has a solubility in water of 10 to 10,000 ppm at room temperature suspended in water in a finely dispersed state; (b) about 0.5 to 5 wt% surfactant having a hydrophile-lipophile balance (HLB) less than 5; (c) about 0.5 to 5 wt% polyvinyl alcohol having a degree of hydrolysis of about 70 to 90 mol% and a degree of polymerization of about 300 to 2,600; (d) about 5 to 30 wt% ethylene glycol; and (e) about 5 to 30 wt% liquid paraffin.

4,324,782

DENTAL CARIES INHIBITING PRODUCT OF IMMUNIZED COW'S MILK HAVING ANTIBODIES SPECIFIC TO KILLED *STREPTOCOCCUS MUTANS* CELLS

Lee R. Beck, 2550 Dunmore Pl., Birmingham, Ala. 35226

Continuation-in-part of Ser. No. 436,946, Jan. 28, 1974, abandoned. This application Mar. 10, 1977, Ser. No. 776,249

Int. Cl.³ A61K *39/09*

U.S. Cl. 424—87 **7 Claims**

1. The method of reducing the incidence of dental caries in animals, which includes the steps of passing into the oral cavity of the host a bovine milk immunoglobulin comprising antibodies specific to killed *Streptococcus mutans* cells in a pharmaceutically accepted vehicle.

4,324,783

ANTIBACTERIAL COMPOSITION FOR MEDICAL USE

Isamu Saikawa; Takashi Yasuda; Masaru Tai; Yutaka Takashita, all of Toyama; Hiroshi Sakai, Takaoka; Michiko Mae, Toyama; Masahiro Takahata, Kosugimachi, and Susumu Mitsuhashi, Musashino, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 913,105, Jun. 6, 1978, Pat. No. 4,199,566. This application Jan. 17, 1980, Ser. No. 113,065

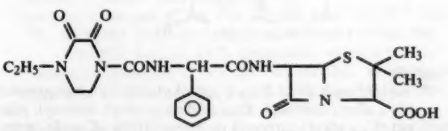
Claims priority, application Japan, Jun. 8, 1977, 52-66707

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 **7 Claims**

1. An antibacterial composition for administration to a host animal, comprising: as active ingredients 6-[D(-)-α-(4-ethyl-2,3-dioxo-1-piperazinylcarbonylamino)-phenylacetamido]-penicillanic acid represented by the formula:



or a pharmaceutically acceptable salt thereof and a β-lactamase-inhibiting penicillin selected from the group consisting of Cloxacillin, Dicloxacillin, Oxacillin, Methicillin, Flucloxacillin and a pharmaceutically acceptable salt thereof, said β-lactamase-inhibiting penicillin being mixed with said penicillanic acid in a ratio of 800/3200 to 3200/800.

4,324,784
PROCESS FOR PREVENTING GROWTH OF MARINE ORGANISMS ON A SUBSTANCE USING HYDROGEN PEROXIDE

Akira Naito, Kashiwa; Toru Hayakawa, Chiba; Masakatsu Nakanishi, Sakai; Sunao Ikuta, Tokorozawa; Shoichiro Kajiwara, Matsudo, and Hitoshi Yamaguchi, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,631
Int. Cl.³ A01N *59/00, 43/84, 43/40, 43/48*
U.S. Cl. 424—130 6 Claims

1. A process for preventing growth of shellfish, Polyzoa and Hydrozoa on a manufactured surface of an industrial plant in contact with sea water, characterized by adding a compound selected from the group consisting of hydrogen peroxide, an inorganic peroxo acid and an organic peroxo acid to the sea water in contact with said surface to provide a concentration of hydrogen peroxide in said sea water in an amount of from 0.01 to 500 ppm.

4,324,785
FOOT POWDER

Emma S. Stevens, Box 4969, Aspen, Colo. 81611, assignor to Emma S. Stevens and Stephen A. Holmes, both of Aspen, Colo.

Filed May 20, 1980, Ser. No. 151,650
Int. Cl.³ A61K *35/78, 7/035, 9/14*
U.S. Cl. 424—195 8 Claims

1. A powder composition for imparting warmth when applied to living, human skin, comprising:
about 30% to about 80%, by volume, powdered cayenne pepper;
about 10% to about 50% by volume, powdered ginger;
about 3% to about 40% by volume, powdered mustard; and
0 to about 20%, by volume, of at least one powdered aromatic substance selected from the group consisting of clove, spearmint and peppermint.

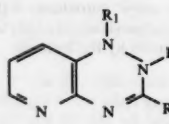
8. A method for imparting warmth to a living human foot comprising applying to said foot about 0.2 to about 2.0 grams of a powder according to claim 1.

4,324,786
PYRIDO[2,3-e]-AS-TRIAZINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Andras Messmer; Pal Benko; György Hajos; Lujza Petocz; Ibolya Kosoczky, and Peter Görög, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Apr. 25, 1980, Ser. No. 143,778
Claims priority, application Hungary, Apr. 28, 1979, EE 2654
Int. Cl.³ A61K *31/535, 31/53;* C07O *471/04*
U.S. Cl. 424—248.54 5 Claims

1. A pyrido[2,3-e]-as-triazine derivative of the general formula (I),



(I)

wherein
R^1 and R^2 each stand for a C_{1-20} alkylcarbonyl, halogenated (C_{1-4} alkyl)-carbonyl, C_{1-4} alkoxycarbonyl, benzoyl, phenyl-(C_{1-4} alkyl)-carbonyl or phenyl-(C_{2-4} alkenyl)-carbonyl group or a 5–10 membered mono- or bicyclic nitrogen-containing heterocyclic acid residue (preferably a pyridylcarbonyl group) containing optionally one or more additional nitrogen, oxygen and/or sulfur atoms in the heterocyclic ring, and optionally one or more identical or different substituents selected from the group consisting of halogen, C_{1-4} alkoxy, nitro and hydroxy, are attached to the aromatic or heterocyclic rings, furthermore one of R^1 and R^2 may also stand for hydrogen atom, or
R^1 and R^2 form, together with the adjacent nitrogen atoms, a pyrazole-3,5-dione ring having optionally a C_{1-6} alkyl substituent in position 4, and
R^3 stands for hydrogen, halogen, C_{1-4} alkoxy, amino, mono-(C_{1-6} alkyl)-amino, di-(C_{1-6} alkyl)-amino, hydroxy, alkylated or acylated hydroxy, morpholino, piperazino, N-(C_{1-6} alkyl)-piperazino, N-benzylpiperazino or N-pyridylpiperazino group or C_{1-4} alkoxycarbonyloxy-group,
or a pharmaceutically acceptable acid addition salt thereof.

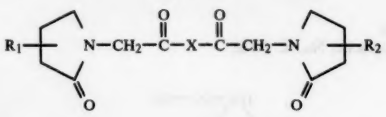
5. A pharmaceutical composition comprising as active ingredient an effective amount of at least one pyrido[2,3-e]-as-triazine derivative of the general formula (I), wherein R^1, R^2 and R^3 are as defined in claim 1, or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutical carrier.

4,324,787
2-OXO-1-PYRROLIDINEACETIC ACID COMPOUNDS AND THEIR MEDICINAL USE

Karl-Heinz Boltze; Hans-Dieter Dell, both of Berg. Gladbach, and Haireddin Jacobi, Leichlingen, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

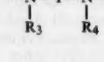
Filed Nov. 30, 1978, Ser. No. 965,374
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757680
Int. Cl.³ A61K *31/40, 31/495;* C07D *207/12, 403/14*
U.S. Cl. 424—250 13 Claims

1. A 2-oxo-1-pyrrolidineacetic acid compound of the formula (I)



(I)

or its physiologically acceptable salts
in which
R_1 and R_2 are identical or different and in each case denote a hydrogen atom, one or two lower alkyl groups, one or two lower alkoxy groups, one trifluoromethyl group or one or two halogen atoms and
X denotes a grouping of the formula



in which
R_3 and R_4, including the two nitrogen atoms and Y, complete a piperazine or pyrazolidine ring which is unsubstituted or substituted by one or more C_1–C_3 alkyl or C_1–C_3 alkoxy groups or one or more halogen atoms, or
R_3 and R_4 in each case independently denote a hydrogen atom or a lower alkyl group and
Y denotes phenylene or pyridylene optionally substituted by lower alkyl, lower alkoxy, halogen atoms or a trifluoromethyl group; denotes an alkylenearylene-alkylene grouping in which arylene is phenylene or pyridylene and is optionally substituted by one or two lower alkyl or lower alkoxy groups, halogen atoms or trifluoromethyl groups; a cycloalkylene group with 4 to 6 ring members which is optionally substituted by one or two alkyl or alkoxy groups or halogen atoms or a trifluoromethyl group; or denotes a straight-chain or branched alkylene grouping which is optionally substituted by a lower alkoxycarbonyl

group and in which one CH_2 group can be replaced by nitrogen, said nitrogen atom being unsubstituted or substituted by lower alkyl.

10. A method of combating disorders of the brain function in warm-blooded animals which comprises administering to the animals a nootropically effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,324,788

ALKOXYALKYLIDENHYDRAZINOPRIDAZINES AND PROCESS FOR THEIR PREPARATION

Luciano Dorigotti, Milan; Giovanni Gaviraghi, Agrate Brianza; Giorgio Pifferi, Milan; Mario Pinza, Corsico, and Claudio Semeraro, Bresso, all of Italy, assignors to I.S.F. S.p.A., Milan, Italy

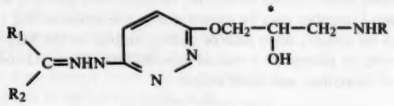
Filed Apr. 21, 1980, Ser. No. 142,457

Claims priority, application Italy, Apr. 23, 1979, 22035 A/79

Int. Cl.[3] **C07D** *237/22, 405/12;* **A61K** *31/50*

U.S. Cl. 424—250 **25 Claims**

1. 3-Alkoxy-6-Alkylidenhydrazinopyridazines



wherein R is alkyl or cycloalkyl having up to 5 carbon atoms, optionally substituted with one of the following: unsubstituted phenyl, phenyl substituted by one, two or three C_1–C_3 alkoxy substituents or a methylene-dioxy group, or cycloalkyl, R_1 is hydrogen or alkyl having from 1 to 3 carbon atoms and R_2 is alkyl having from 1 to 3 carbon atoms, carboxyl or phenyl in the form of optically active isomers or a mixture of same and the corresponding pharmaceutically acceptable nontoxic acid addition salts.

25. A pharmaceutical composition containing an antihypertensively effective amount of a compound according to claim **1** in admixture with a pharmaceutically acceptable diluent.

4,324,789

1-BENZYL-5-NITRO-4-(PYRIDYL OR IMIDAZOLYL) ALKYLAMINO-1,2,3,6-TETRAHYDROPYRIMIDINES AND BLOCKING OF HISTAMINE H_2-RECEPTORS THEREWITH

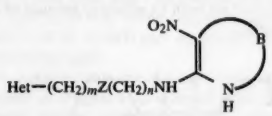
Michael L. Roantree, Welwyn Garden City, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 43,785, May 30, 1979, Pat. No. 4,238,493. This application Jun. 16, 1980, Ser. No. 159,525

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/06*

U.S. Cl. 424—251 **8 Claims**

1. A compound represented by Structure 1:



Structure 1

in which

Het is selected from the group consisting of imidazolyl or pyridyl rings, such rings optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, chloro, bromo, hydroxy, lower alkoxy or amino;

Z is sulphur, methylene or oxygen;

m is 0, 1 or 2 and n is 2 or 3 provided that m + n is 3 or 4; and

B is a 2-aza-1,3-propanediyl group ($—CH_2NR^3CH_2—$ where R^3 is benzyl), or a pharmaceutically acceptable acid addition salt thereof.

8. A method of blocking histamine H_2-receptors which comprises administering an effective amount of a compound according to claim **1** to an animal in need of such treatment.

4,324,790

ANTIPSYCHOTIC TETRAHYDROPYRIDINYL-INDOLES, COMPOSITIONS AND METHOD OF USE

Jacques Guillaume, Sevran; Lucien Nedelec, Le Raincy, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

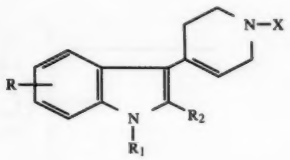
Filed Jun. 30, 1980, Ser. No. 163,966

Claims priority, application France, Jul. 13, 1979, 79 18217

Int. Cl.[3] **A61K** *31/44;* **C07D** *401/04*

U.S. Cl. 424—263 **15 Claims**

1. A compound selected from the group consisting of an indole of the formula



wherein X is selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 3 to 5 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms, aralkyl of 7 to 12 carbon atoms, hydroxyalkyl of 2 to 5 carbon atoms and phenoxyalkyl of 1 to 5 alkyl carbon atoms, R is selected from the group consisting of hydrogen, halogen, alkoxy of 1 to 3 carbon atoms, nitro, amino, trifluoromethyl and methylthio, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms with the proviso that if R is hydrogen, halogen or alkoxy of 1 to 3 carbon atoms, X must be hydroxyalkyl or phenoxyalkyl and their non-toxic, pharmaceutically acceptable acid addition salts.

11. A method of inducing antipsychotic activity in a warm-blooded animal comprising administering to a warm-blooded animal an amount of at least one compound of claim **1** sufficient to induce antipsychotic activity.

4,324,791

HETEROCYCLIC ANTIDIARRHEAL COMPOSITIONS & METHODS OF USE

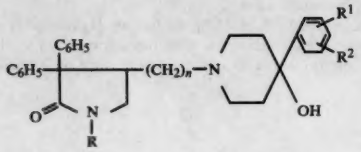
William J. Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 796,264, May 12, 1977, Pat. No. 4,120,969, which is a continuation-in-part of Ser. No. 615,952, Sep. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 541,684, Jan. 16, 1975, abandoned. This application Aug. 1, 1978, Ser. No. 930,124

Int. Cl.[3] **A61K** *31/445*

U.S. Cl. 424—267 **6 Claims**

1. A method for the treatment of a warm-blooded animal afflicted with diarrhea which comprises administering to said animal in an amount sufficient to relieve said diarrhea, a compound selected from the group consisting of 1-R-4-(omega-substituted alkyl)-3,3-diphenyl-2-pyrrolidinones of the formula:



wherein;

R is selected from the group consisting of hydrogen, lower alkyl, cyclohexyl and benzyl,

R^1 is selected from the group consisting of hydrogen, chloro, bromo, fluoro, trifluoromethyl and lower-alkoxy,

R^2 is selected from the group consisting of hydrogen, chloro, bromo and fluoro, and

n is 1, 2 or 3 and the pharmaceutically acceptable acid addition salts thereof.

4,324,792

ANTIHISTAMINIC IMIDAZOLES

John Bradshaw, Ware; Alexander W. Oxford, Royston, and David I. C. Scopes, Ware, all of England, assignors to Glaxo Group Limited, London, England

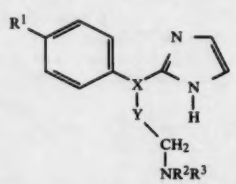
Filed Oct. 3, 1980, Ser. No. 193,846

Claims priority, application United Kingdom, Oct. 3, 1979, 34347/79

Int. Cl.³ A61K *31/445;* **C07D** *233/64*

U.S. Cl. 424—267 **11 Claims**

1. A compound of the formula (I)



(I)

or a physiologically acceptable salt thereof in which

X—Y— represents either CH—CH_2 or C=CH—; R^1 represents hydrogen, halogen, C_{1-4} alkoxy, hydroxy, C_{1-4} alkyl, $R^4CH(OH)$—, cyano or R^5CONH—; R^2 and R^3, which may be the same or different, each represents a C_{1-4} alkyl group or C_{3-6} alkenyl group or R^2 and R^3 form a saturated alkylene chain and together with the nitrogen atom to which they are attached form a saturated heterocyclic ring containing from 5 to 7 members;

R^4 represents hydrogen or C_{1-4} alkyl; and

R^5 represents hydrogen, C_{1-4} alkyl or C_{1-4} alkoxy.

11. A method of treating a condition mediated through histamine H_1-receptors which comprises administering to a patient an effective amount of a compound according to claim 1 to relieve said condition.

4,324,793

4-NITRO-2-TRICHLOROMETHYLPHENYL DISULFIDES

Helmut Hagen, Frankenthal; Wolfgang Reuther, Heidelberg-Ziegelhausen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

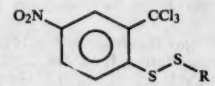
Filed Feb. 23, 1979, Ser. No. 14,892

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810698

Int. Cl.³ C07D *239/06, 239/02*

U.S. Cl. 424—270 **15 Claims**

1. A 4-nitro-2-trichloromethylphenyl disulfide of the formula



where R denotes a radical selected from Group I consisting of benzthiazole, benzimidazole, thiazole, imidazole, thiadiazole, oxazole, benzoxazole, oxdiazole, tetrazole and pyridyl, which Group I member may be substituted in the benzene ring 1 to 3 times by chloro, nitro and/or cyano, and/or in the heterocyclic ring by phenyl, or a radical selected from Group II consisting of thiazoline and imidazoline.

4,324,794

INHIBITION OF RESPIRATORY SYNCYTIAL VIRUS-INDUCED CELL FUSION BY AMIDINO COMPOUNDS

Richard R. Tidwell; Edward J. Dubovi, and Joachim D. Geratz, all of Chapel Hill, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Aug. 26, 1980, Ser. No. 181,341

Int. Cl.³ A61K *31/415, 31/155, 31/40*

U.S. Cl. 424—273 B **5 Claims**

1. A method for the treatment of respiratory syncytial virus-induced cell fusion which comprises administering to a host in need of said treatment an effective amount of an aromatic bis-amidine compound selected from the group consisting of bis(5-amidino-2-benzimidazolyl)methane and 1,2-bis(5-amidino-2benzimidazolyl)ethane.

4,324,795

ACARICIDAL AGENTS

Tetsuo Okauchi, Hirakata; Kentaro Hiraga, Nagaokakyo, and Yasuo Sato, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

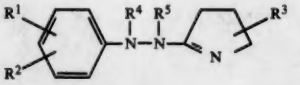
Filed Sep. 24, 1980, Ser. No. 190,412

Claims priority, application Japan, Sep. 25, 1979, 54-123432

Int. Cl.³ A01N *43/36*

U.S. Cl. 424—274 **11 Claims**

1. A method of eradicating ticks or mites which comprises bringing them into contact with an effective amount of a compound of the formula:



wherein

R^1 and R^2 are each hydrogen, halogen or lower alkyl;

R^3 is hydrogen or phenyl which may be substituted with halogen;

R^4 is hydrogen or lower alkanoyl and R^5 is hydrogen or phenyl or its acid addition salt.

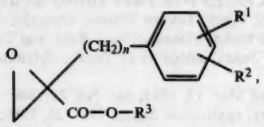
4,324,796

SUBSTITUTED OXIRANECARBOXYLIC ACIDS, THEIR USE AND MEDICAMENTS CONTAINING THEM

Klaus Eistetter, Constance, and Erich Rapp, Radolfzell, both of Fed. Rep. of Germany, assignors to BYK Gulden Lomberg Chemische Fabrik Gesellschaft mit beschränkter Haftung, Constance, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 182,934
Claims priority, application U.S.S.R., Sep. 7, 1979, 8068/79
Int. Cl.[3] C07D *303/48;* A61K *31/335*
U.S. Cl. 424—278 21 Claims

1. A substituted oxiranecarboxylic acid of the formula



(I)

wherein

R^1 is —H, halo, hydroxyl, lower alkyl, lower alkoxy or trifluoromethyl,

R^2 has one of the meanings of R^1,

R^3 is —H or lower alkyl and

n is an integer from 1 to 8, inclusive,

or a salt of each carboxylic acid.

21. A method for the prophylaxis or treatment of a glucose or fat metabolism disorder which comprises administering an effective amount of a pharmacologically-acceptable compound according to one of claims 1 to 18 to a mammal subject to or afflicted with such disorder.

4,324,797

METAL SOAP COMPOSITIONS

Hiroshi Suzuki, Ibaraki, Japan, assignor to Seiichi Ishizaka, Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,819
Claims priority, application Japan, Aug. 8, 1979, 54-100919
Int. Cl.[3] A61K *31/28;* A61L *13/00;* B01F *17/00;* C09K *15/32*
U.S. Cl. 424—287 6 Claims

1. A water-soluble metal soap composition which consists essentialy of a metal soap selected from the group consisting of lithium stearate, calcium ricinoleate, lithium laurate, cobalt laurate, aluminum monooleate, stannous caprate, copper naphthenate, zinc linoleate, zirconium rosinate, vanadium caprylate, tungsten capronate, manganese ricinoleate, cobalt myristate, calcium salt of castor oil fatty acid, magnesium salt of castor oil fatty acid, and trialuminum octoate, and a chelating agent, said metal soap being present in said composition in an amount of 10 to 1/1000 part by weight based on one part of said chelating agent.

2. A water-soluble metal soap composition which consists essentially of a metal soap selected from the group consisting of lithium stearate, calcium ricinoleate, lithium laurate, cobalt laurate, aluminum monooleate, stannous caprate, copper naphthenate, zinc linoleate, zirconium rosinate, vandium caprylate, tungsten capronate, manganese ricinoleate, cobalt myristate, calcium salt of castor oil fatty acid, magnesium salt of castor oil fatty acid, and trialuminum octoate, a chelating agent and up to 50% by weight based on the total amount of said metal soap and said chelating agent of a surfactant, said metal soap being present in said composition in an amount of 10 to 1/1000 part by weight based on one part of said chelating agent.

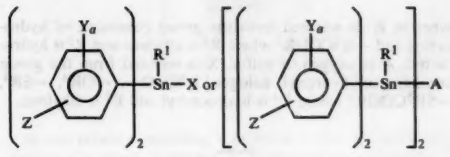
4,324,798

FUNGICIDAL BIS(SUBSTITUTED PHENYL)ALKYLTIN COMPOUNDS

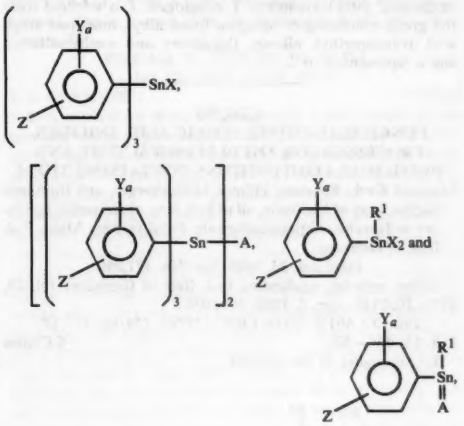
Melvin H. Gitlitz, and David A. Russo, both of Edison, N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Oct. 8, 1980, Ser. No. 195,276
Int. Cl.[3] A01N *55/04;* C07F *7/22*
U.S. Cl. 424—288 13 Claims

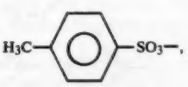
1. A composition comprising a triorganotin compound of the general formula



in the substantial absence of compounds of the general formulae



wherein R^1 is selected from the group consisting of hydrocarbyl and $—R^2COOR^3$ where R^2 is alkylene and R^3 is hydrocarbyl, A is oxygen or sulfur, X is selected from the group consisting of hydroxyl halogen, $R^4COO—$, $—OR^4$, $—SR^4$, $—SR^5COOR^4$ where R^4 is hydrocarbyl and R^5 is Alkylene, H_3C

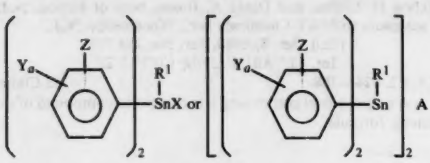


carbamate or dithiocarbamate, Y is halogen, Z is selected from the group consisting of halogen, linear alkyl, branched alkyl, aryl, trihalomethyl, alkoxy, thioalkoxy and methylsulfonyl, and a represents 0 or 1, with the proviso that R^1 is not ethyl when X is halogen and R^1 is not cyclohexyl when X is

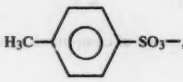
or halogen.

7. A composition for controlling the growth of fungi, said

composition comprising an inert carrier and a triorganotin compound of the general formula



wherein R^1 is selected from the group consisting of hydrocarbyl and $—R^2COOR^3$ where R^2 is alkylene and R^3 is hydrocarbyl, A is oxygen or sulfur, X is selected from the group consisting of hydroxyl, halogen, $R^4COO—$, $—OR^4$, $—SR^4$, $—SR^5COOR^4$ where R^4 is hydrocarbyl and R^5 is alkylene,



carbamate, dithiocarbamate, Y is halogen, Z is selected from the group consisting of halogen, linear alkyl, branched alkyl, aryl, trihalomethyl, alkoxy, thioalkoxy and methylsulfonyl, and a represents 0 or 1.

4,324,799

FUNGICIDAL THIOGLYCOLIC ACID ANILIDES, PROCESSES FOR THEIR MANUFACTURE AND PESTICIDAL COMPOSITIONS CONTAINING THEM

Manfred Koch, Eppstein; Hilmar Mildenberger, and Burkhard Sachse, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

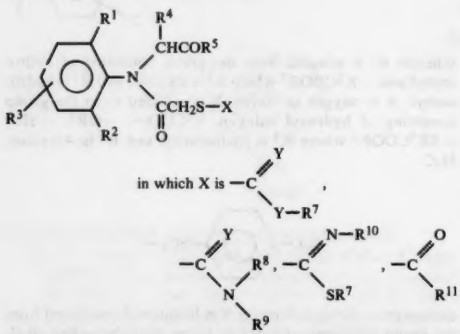
Filed Jul. 23, 1980, Ser. No. 171,346

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930145; Apr. 3, 1980, 3013104

Int. Cl.[3] **A01N** *37/14;* **C07C** *149/40, 154/00, 155/08*

U.S. Cl. 424—301 **6 Claims**

1. Compound of the formula



or hydrogen; R^1 is $(C_1–C_4)$-alkyl, halogen, $(C_1–C_3)$-alkylthio, $(C_1–C_4)$-alkoxy or $(C_3–C_4)$-alkenyl; R^2 is hydrogen, $(C_1–C_4)$-alkyl or halogen; R^3 and R^4 are hydrogen or methyl; R^5 is hydroxyl, $(C_1–C_4)$-alkoxy, $(C_1–C_3)$-alkylthio, $(C_1–C_2)$-alkoxy-$(C_1–C_2)$-alkoxy, amino, $(C_1–C_2)$-alkylamino or di-$(C_1–C_2)$-alkylamino; Y is oxygen or sulfur; R^7 is $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkyl substituted by methoxy, ethoxy or halogen, or $(C_3–C_6)$-cycloalkyl, $(C_3–C_4)$-alkenyl or $(C_3–C_4)$-alkynyl; R^8 is hydrogen or $(C_1–C_4)$-alkyl and when Y is S is hydrogen, R^9 is $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkyl substituted by halogen or $(C_1–C_2)$-alkoxy, or $(C_3–C_4)$-alkenyl, furfuryl or tetrahydrofurfuryl; R^{10} is -CN, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkyl, substituted by halogen or $(C_1–C_2)$-alkoxy, or allyl or furfuryl; and R^{11} is hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkyl substituted by one or three halogen atoms, $(C_1–C_2)$-alkoxy or $(C_1–C_2)$-alkylthio, or $(C_2–C_4)$-alkenyl.

3. Fungicidal composition containing, as an active component, a fungicidally effective amount of a compound defined in claim 1 and a suitable inert diluent.

4,324,800

NOVEL BENZYLALCOHOL DERIVATIVES AND PROCESSES FOR PREPARING SAME

Norihide Umino, Ageo; Tokuro Ohishi, Shakujii; Muneyoshi Ikezaki, Takarazuka; Masanori Sato, Kuki, and Taku Nagao, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

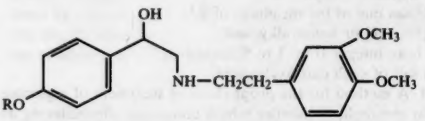
Filed Mar. 12, 1981, Ser. No. 243,246

Claims priority, application Japan, Mar. 28, 1980, 55-41091

Int. Cl.[3] **A61K** *31/24;* **C07C** *69/017, 69/78*

U.S. Cl. 424—308 **9 Claims**

1. A compound of the formula:



(I)

wherein R is alkanoyl of one to 20 carbon atoms, benzoyl or lower alkyl-benzoyl, or a pharmaceutically acceptable acid addition salt thereof.

9. A cardiotonic composition comprising an effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

4,324,801

PHENYLGUANIDINE ACETYLSALICYLATE COMPOUNDS, PROCESS FOR PRODUCTION THEREOF, AND PHARMACEUTICAL COMPOSITION THEREOF

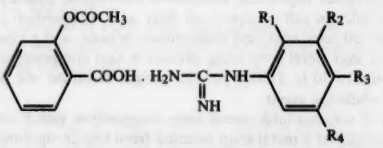
Meiki Matsuzaki, Hachioji; Hiroshi Okabe, Yokohama; Seishiro Tanaka, Sendai; Takao Takiguchi, Tokyo, and Kunikatsu Onodera, Chiba, all of Japan, assignors to Banyu Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,165

Int. Cl.[3] **C07C** *101/00, 69/157, 51/02;* **A61K** *31/155, 31/19, 31/615*

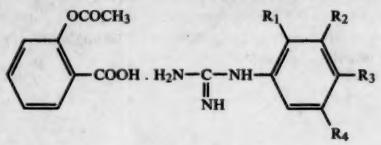
U.S. Cl. 424—311 **7 Claims**

1. A compound of the formula



wherein R_1 is a member selected from the group consisting of a hydrogen atom, lower alkyl groups and lower alkoxy groups, R_2 is a member selected from the group consisting of a hydrogen atom, halogen atoms, lower alkyl groups, a hydroxyl group and a trifluoromethyl group, R_3 is a member selected from the group consisting of a hydrogen atom, halogen atoms, lower alkyl groups, lower alkoxy groups, an acetyl group, a carbamoyl group and lower alkyl carboxylate groups, and R_4 represents a hydrogen atom or a halogen atom.

4. A pharmaceutical composition composed of an anti-inflammatorily effective amount or an antipyretically and analgesically effective amount of a compound of the formula



wherein R_1 is a member selected from the group consisting of a hydrogen atom, lower alkyl groups and lower alkoxy groups, R_2 is a member selected from the group consisting of a hydrogen atom, halogen atoms, lower alkyl groups, a hydroxyl group and a trifluoromethyl group, R_3 is a member selected from the group consisting of a hydrogen atom, halogen atoms, lower alkyl groups, lower alkoxy groups, an acetyl group, a carbamoyl group and lower alkyl carboxylate groups, and R_4 represents a hydrogen atom or a halogen atom; and a pharmaceutically acceptable carrier or diluent.

4,324,802

COSMETIC OIL AND COMPOSITION CONTAINING THE SAME

Constantin Koulbanis; Catherine Millet; Arlette Zabotto, all of Paris, and Alain Brun, Pavillons-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 1, 1980, Ser. No. 211,946

Claims priority, application France, Dec. 18, 1979, 79 30956; Aug. 13, 1980, 80 17899

Int. Cl.³ A61K *7/48, 7/44, 7/26, 7/021*

U.S. Cl. 424—364 12 Claims

1. A cosmetic oil for improving or maintaining the suppleness of the skin and being spreadable on the skin so as to leave thereon a hydrophobic film having a non-oily, unctuous feel or touch comprising a mixture of from 20 to 45 weight percent jojoba oil, 25 to 40 weight percent turnsole oil and 20 to 40 weight percent of a previously extracted non-saponifiable fraction of a vegetable oil selected from the group consisting of soybean oil, avocado oil, corn oil, turnsole oil and mixtures thereof.

4,324,803

PROCESS FOR DEPOSITING ON SUBSTRATES, BY CATHODE SPUTTERING, A SELF-LUBRICATING COATING OF METAL CHALCOGENIDES AND THE COATING OBTAINED BY THIS PROCESS

Erich Bergmann, Bienne, and Georges Melet, Meyrin, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

PCT No. PCT/CH79/00132, § 371 Date Jun. 9, 1980, § 102(e) Date May 20, 1980, PCT Pub. No. WO80/00712, PCT Pub. Date Apr. 17, 1980

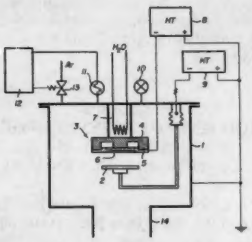
PCT Filed Oct. 8, 1979, Ser. No. 196,483

Claims priority, application Switzerland, Oct. 9, 1978, 10455/78

Int. Cl.³ B32B *9/00;* C23C *15/00*

U.S. Cl. 428—472 12 Claims

1. In a process for depositing, by cathode sputtering, a self-lubricating coating of a metal chalcogenide, according to which a target of the material to be sputtered, comprising a chalcogenide or a mixture of chalcogenides, is bombarded with ions formed by a cathode discharge produced in the immediate vicinity of the said target and in a rare gas atmosphere, the materials thus expelled from the target being deposited on a substrate placed opposite the said target, the improvement wherein the cathode space of the said target is subjected to a magnetic field, the distance between the target and the said substrate is adjusted so that it corresponds approximately to the mean free path of the molecules expelled from the target, and the sputtering current density is such that the rate of deposition of the surface of the substrate opposite the said target is at least 0.1 μm/minute, under conditions so as to form turbostratic deposits on the substrate.



10. An article comprising a substrate and a self-lubricating coating of a metal chalcogenide of turbostratic structure and long durability when subjected to dry friction.

4,324,804

PREPARATION OF A SOFT CREAM CHEESE PRODUCT

Loren L. Davis, Vernon Hills, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Aug. 15, 1979, Ser. No. 66,613

Int. Cl.³ A23C *19/02, 19/12*

U.S. Cl. 426—36 7 Claims

1. A method for manufacturing a soft bodied cream cheese product which is spreadable at refrigeration temperature comprising the steps of providing a cream cheese dairy mix comprising at least about 30 percent by weight of substantially unhomogenized milkfat, at least about 40 percent by weight of total dairy solids and not more than 60 percent moisture based on the weight of said mix, pasteurizing said mix, culturing said mix to provide a cultured cream cheese dressing mix having a pH of about 5.2 or less, blending said cultured dressing mix with a firm bodied cream cheese curd component comprising at least about 30 percent by weight of homogenized milkfat, at least about 40 percent by weight total dairy solids and not more than about 60 percent moisture, based on the weight of said firm bodied cream cheese product, to provide a substantially uniform blend comprising at least about 33 weight percent milkfat and not more than about 55 weight percent moisture based on the weight of said blend, and packaging said blend at an elevated temperature of at least about 150° F. to provide a packaged, soft bodied cream cheese product having a spreadable consistency at refrigeration temperature.

4,324,805

METHOD OF PRODUCING SOY PROTEIN HYDROLYSATE FROM FAT-CONTAINING SOY MATERIAL, AND SOY PROTEIN HYDROLYSATE

Hans A. S. Olsen, Vanlose, Denmark, assignor to Novo Industri A/S, Denmark

Filed Jul. 7, 1980, Ser. No. 166,405

Claims priority, application United Kingdom, Jul. 11, 1979, 24177/79

Int. Cl.³ A23J *3/00;* A23L *1/20*

U.S. Cl. 426—46 13 Claims

9. A method for production of soy protein hydrolysate and oil from soya material containing recoverable amounts of oil which comprises:

water washing such a soy material at pH 3.5–5.5, thereby partially defatting the soy material; and extracting water soluble substances therefrom; then

separating the wash water into an oil phase and an aqueous phase;

hydrolyzing the partially defatted soy material at pH 6–12 with effective amounts of a proteolytic enzyme in water to

a DH of 1-20; thereafter deactivating the proteolytic enzyme; and then

separating the hydrolysis mixture into a sludge phase, an aqueous phase and an oil phase,

the oil phases from the hydrolysis mixture and from the wash water being the oil product, and the aqueous phase from the hydrolysis mixture being the soy protein hydrolysate product.

4,324,806

METHOD FOR THE SOFTENING OF TOUGH MUSHROOMS

Helga Schmitz, Hofaekerstr. 1, 3575 Kirchhain 1, Fed. Rep. of Germany

PCT No. PCT/EP79/00043, § 371 Date Feb. 5, 1980, § 102(e) Date Feb. 5, 1980, PCT Pub. No. WO80/00001, PCT Pub. Date Jan. 10, 1980

PCT Filed Jun. 5, 1979, Ser. No. 192,111

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1978, 2824553

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—52 **4 Claims**

1. A method for treating tough mushrooms, comprising the steps of:

placing cleaned mushroom material within a container;

adding a solution to said mushroom material within said container, said solution comprising a liquid having a pH of from 3 to 5.5 and having a salt percentage of 0.02 to 0.5 molar; and

allowing said mushroom material and said solution to interact in the presence of an enzyme selected from the group consisting of glucanase and chitinase at a temperature of from 20° C. to 55° C. for a period ranging from 12 hours to 5 days said enzyme being added to said solution in an amount in excess of what is naturally in said mushroom material, said amount of enzyme being sufficient to increase the softening of said mushroom material.

4,324,807

SIMULATED ADIPOSE TISSUE

Myung K. Kim, Congers, and Joaquin C. Lugay, Thornwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,538

Int. Cl.³ A23D *5/02*; A23J *3/00*

U.S. Cl. 426—104 **3 Claims**

1. A restructured natural meat product comprising natural meat and a simulated adipose tissue which comprises an at least two phase system wherein a 1st phase comprising from 30 to 60% fat is dispersed within a second phase matrix substantially enveloping the dispersed fat, wherein the fat in the first phase is separated into globules having an average diameter of from about 10 to about 120 microns; and the second phase matrix is a coagulated mixture comprising from 4 to 18% based on total system weight of a heat coagulable component and at least 2% based on total system weight of a water soluble, film forming component, the matrix having the ability to hold the fat globules within it, and yet due to the presence of the water soluble, film forming component will smoothly melt upon heating.

4,324,808

PROCESS FOR PREPARING FREEZE DRIED SOLUBLE COFFEE

John H. Wertheim, and Abraham R. Mishkin, both of Marysville, Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 537,679, Mar. 28, 1966. This application Sep. 26, 1979, Ser. No. 79,056

Claims priority, application Switzerland, Apr. 2, 1965, 4606/65

Int. Cl.³ A23F *5/32, 5/38*

U.S. Cl. 426—385 **2 Claims**

1. Process for preparing freeze dried soluble coffee, which comprises adding sufficient inert gas to a concentrated aqueous extract of roast coffee to provide a foam having a density between 0.6 and 0.8 gm/cc, freezing the foamed extract to a solid mass, grinding the frozen foam to an average particle size of about 0.1 to 0.5 mm, freeze drying the ground particles to provide finely powdered soluble coffee, and agglomerating the finely powdered soluble coffee.

4,324,809

FLAVORING WITH α, β-UNSATURATED ALDEHYDES

Wilhelm Pickenhagen, Chavannes-Des-Bois, Switzerland, and Alain Velluz, Reignier, France, assignors to Firmenich SA, Geneva, Switzerland

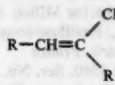
Filed Jun. 25, 1979, Ser. No. 51,506

Claims priority, application Switzerland, Jul. 6, 1978, 7360778

Int. Cl.³ A23L *1/226, 1/231*

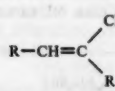
U.S. Cl. 426—534 **6 Claims**

1. A method for improving the organoleptic properties of foodstuffs and beverages having a meaty taste which comprises adding thereto from about 0.01 to 10 parts per million by weight based on the weight of said foodstuff or beverage of at least one of the α,β-unsaturated aldehydes of the formula



wherein symbol R represents a linear alkyl radical having 3 to 6 carbon atoms and R^1 represents a linear or branched alkyl radical having 1 to 7 carbon atoms.

5. A method to improve the oily-green gustative note of a foodstuff subjected to a frying process which method comprises adding thereto from about 0.01 to 10 parts per million by weight based on the weight of said foodstuff of at least one of the α,β-unsaturated aldehydes of the formula



wherein symbol R represents a linear alkyl radical having 3 to 6 carbon atoms and R^1 represents a linear or branched alkyl radical having 1 to 7 carbon atoms.

4,324,810

HOP EXTRACTS AND METHOD OF PREPARATION

Henry Goldstein, Brookfield; Walter Fly, Milwaukee; Patrick Ting, Brookfield, and Etzer Chicoye, Wauwatosa, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed May 29, 1980, Ser. No. 154,577

Int. Cl.³ C12C *3/00, 9/02*

U.S. Cl. 426—600 **9 Claims**

1. A method of preparing a hop preparation containing reduced isohumulone without using added organic solvents, said method consisting of:

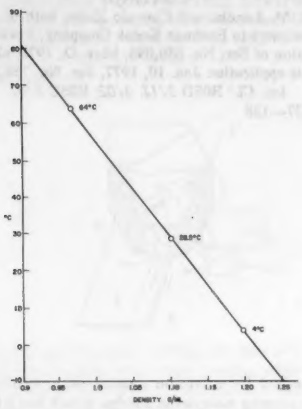
a. adding an aqueous reducing solution to a crude extract of hops which is substantially free of hydrocarbon solvents and contains humulone;

b. heating the resulting mixture to isomerize and reduce the humulone;

c. acidifying the reaction mixture to cause an aqueous phase and an organic phase to form;

d. adjusting the temperature of the reaction mixture to facili-

tate the separation of the aqueous and the organic phases; and



e. then isolating the organic phase which contains the desired reduced isohumulone.

4,324,811

DOUGH-LIKE PRODUCTS EXHIBITING REDUCED WATER ACTIVITY CONTAINING DERIVED PROTEIN-CONTAINING COMPOSITIONS

Susan L. Eugley, Harrison, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 141,019, Apr. 17, 1980, abandoned. This application Dec. 23, 1980, Ser. No. 219,561

Int. Cl.³ A23C *21/08;* A23J *3/00*

U.S. Cl. 426—656 **13 Claims**

1. A product of dough-like consistency exhibiting reduced water activity comprising a blend of a first composition which comprises at least 65% of a low molecular weight protein-containing material derived from plant or animal sources wherein the molecular weight of said protein-containing material is less than 30,000, said material having a total Kjeldahl nitrogen content of from about 0.45% to about 2.1% of which at least 60% of the nitrogen is non-protein nitrogen, from about 0% to about 35% of a member selected from the group consisting of from about 1% to about 15% gelatin, from about 1% to 15% gelatin and from about 5% to about 25% water-soluble polyphosphate, the additive total of gelatin and phosphate not to exceed about 35%, from about 0.5% to about 5% of a gum, and mixtures thereof; and from about 0% to about 30% of a whipping aid, all percentages unless otherwise stated being by weight based on the total dry solids weight of the aforecited ingredients in said first composition, and from about 20% to about 75% by weight based on the dry weight of said blend of a starch having a viscosity within the range of from about 1,000 cps to about 200,000 cps in a 10% solution at 25° C. said product having a moisture content ranging from about 20% to about 50% by weight based on the total weight of said product of dough-like consistency.

4,324,812

METHOD FOR CONTROLLING THE FLOW OF COATING MATERIAL

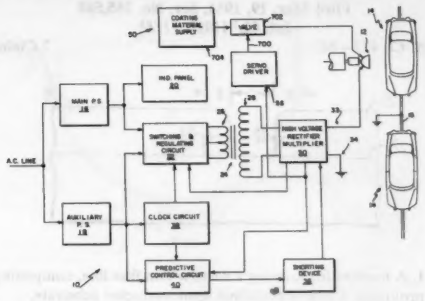
Stanley L. Bentley, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed May 29, 1980, Ser. No. 154,496

Int. Cl.³ B05D *1/04*

U.S. Cl. 427—8 **3 Claims**

1. A method for controlling the flow of coating material from a coating material dispensing device to a target to be coated with the coating material, including the steps of providing a source of the coating material, controlling the flow of coating material from the source through the device with control means having a control input, establishing a potential difference between the device and the target to maintain an electric field between the device and target, charging the particles of coating material dispensed from the device into the field so that the particles move through the field from the



device to the target to coat it, sensing the current flow, generating a signal related to the sensed current, and coupling the sensed current-related signal to the control input, a tendency of the sensed current to decrease causing an increase in the flow of coating material through the device, and a tendency of the sensed current to increase causing a decrease in the flow of coating material through the device.

4,324,813

METHOD AND APPARATUS FOR CURING LACQUER LAYERS WITH HIGH-ENERGY ELECTRONS

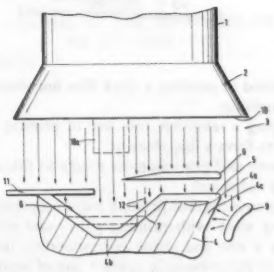
Karl-Heinz Sonnenberg, Weyhausen, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,975

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922367

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **5 Claims**



1. In a method of curing a lacquer coating applied to an article of complex surface configuration, including the steps of generating and accelerating electrons, passing the electrons through an electron outlet window and directing the electrons onto the article for directly irradiating coated surfaces thereof; the article having a first surface portion inaccessible by direct electron irradiation; the improvement comprising the step of directing a part of the electrons to a second article surface portion which is directly accessible to electron irradiation and causing one part of the electrons to be reflected from said

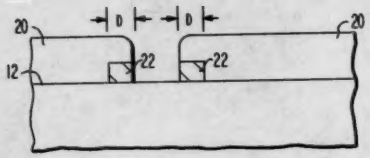
second surface portion onto said first surface portion for curing the lacquer coating on said first surface portion.

4,324,814

METHOD FOR FORMING A NARROW THIN FILM LINE

Walter F. Reichert, E. Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,589
Int. Cl.³ H01L 21/88
U.S. Cl. 427—86 7 Claims



1. A method for forming a narrow thin film line, comprising:
providing a monocrystalline semiconductor substrate;
forming a thin film pattern on a surface of said substrate;
growing an epitaxial layer on said surface, said layer growing laterally, over the thin film pattern, a predetermined distance; and
removing that portion of the thin film not covered by the epitaxial layer.

4,324,815

SCREEN-PRINTING MASK AND METHOD

Minoru Mitani; Kiyoharu Hashimoto; Kenjiro Ninomiya; Tochikiyo Miyazaki; Otokuma Hashimoto, and Hideki Mori, all of Fuchu, Japan, assignors to Mitani Electronics Industry Corp., Tokyo, Japan

Division of Ser. No. 957,187, Nov. 2, 1978, Pat. No. 4,242,401.
This application Jul. 7, 1980, Ser. No. 166,338
Int. Cl.³ B05D 1/36; H05K 3/12
U.S. Cl. 427—96 10 Claims

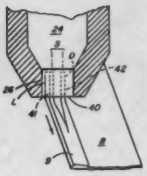
1. A method of printing a thick film line element on a substrate, comprising:
(a) applying a relatively thin line of printing paste to substrate to form a line element;
(b) allowing said printing paste to dry so that its viscosity is greatly increased;
(c) filling an elongated printing pattern opening of a screen-printing mask with printing paste, said printing pattern having a size and shape corresponding to the size and shape of the previously applied line of printing paste;
(d) superimposing the printing pattern of said screen-printing mask on the previously applied line element, with the underside of the printing paste that fills said printing pattern contacting an exposed surface of said line element;
(e) moving said screen-printing mask away from said substrate while allowing said printing paste to remain in contact with the previously applied line element, thereby applying another line element to the previously applied line element; and
(f) repeating steps b-e as desired until a line element of printing paste having a predetermined thickness has been applied to said substrate.

4,324,816

METHOD FOR FORMING A STRIPE BY EXTRUSION COATING

Newton C. M. Landis, and Corrado Zollo, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 580,083, May 22, 1975, abandoned.
This application Jan. 10, 1977, Ser. No. 758,230
Int. Cl.³ B05D 5/12, 3/02; B05C 3/02
U.S. Cl. 427—128 10 Claims



1. A method for extrusion coating on a web a magnetic dispersion striping material in a stripe which has a high width to thickness ratio and is of predetermined uniform cross-sectional dimensions, including substantially uniform thickness, which method comprises the steps of:
moving said web along a predetermined path;
extruding said magnetic dispersion striping material through a die located above the path of the web having at least two bores of predetermined dimensions positioned in a predetermined spaced relation with the path of the web to form columns of the extruded material which extend perpendicularly to the path of the web and are of sufficient stability to bridge the space between the die and the web; and
impinging the extruded columns of material on the moving web; the size and spacing of said bores, the space between said die and said web, and the speed at which said web is moved being so selected that said extruded columns of material coalesce after impinging on said web into a stripe of uniform cross-sectional dimensions, including substantially uniform thickness, having a high width to thickness ratio.

4,324,817

PROCESS FOR MAKING CARBONLESS COPYING PAPER

Manfred Dahm, Leverkusen; Gert Jabs, Odenthal, and Christian Wegner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,306
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930408
Int. Cl.³ B41M 5/16
U.S. Cl. 427—150 5 Claims

1. A process for producing a "one-component" carbonless copying paper, which comprises forming microcapsules by reacting a polyisocyanate with a polyamine in an aqueous medium in the presence of (1) a color former whereby the color former becomes encapsulated in the resulting microcapsules and (2) a basic inorganic salt which becomes converted in situ during the microcapsule formation into an insoluble polymer acid or oxide developer capable of reacting with the color former to form a dyestuff, said basic inorganic salt being added to the aqueous reaction mixture after the addition of the polyamine; and coating the resulting mixture of encapsulated color former and developer onto a paper support.

4,324,818

PRODUCTION OF HEAVY METAL COATINGS ON ONLY ONE FACE OF STEEL STRIPS

Tadeus Sendzimir, 269 Brookside Rd., Waterbury, Conn. 06720

Filed Feb. 21, 1980, Ser. No. 123,275
Int. Cl.³ B05D 1/12
U.S. Cl. 427—174 1 Claim

1. Process of continuously coating one face of a forwardly progressing ferrous strip with a main coating while preserving the opposite face clean and free from oxides, which comprises

(a) cleaning said strip and depositing on said first-mentioned face a thin primary metallic coating of a metal capable of fusion with the main coating metal, to completely cover said face to a depth of at least one molecule, followed by washing and drying of said strip,

(b) temporarily deflecting and guiding said strip into a substantially cylindrical outline with the precoated face innermost,

(c) spraying said last-mentioned face uniformly with a predetermined quantity of the main coating metal in fine particulate form from a rotatable source of supply which is coaxial with said cylindrical outline,

(d) pulling said coated strip under tension in a horizontal plane through a non-oxidizing atmosphere while applying heat thereto to melt said particles of said main coating metal and to effect the fusion of the latter with the metal of the underlying primary coating,

(e) immediately thereafter applying cooling means to said strip so as to quickly solidify said molten layer of the main coating metal,

(f) continuing to withdraw heat from said strip until it reaches a temperature below the oxidizing temperature for ferrous strips, and

(g) removing said strip from said non-oxidizing atmosphere.

4,324,819

CATALYST FOR HYDRAZINE DECOMPOSITION AND THE METHOD OF PRODUCING THE CATALYST

Philip J. Birbara, Windsor Locks, Conn., assignor to United Aircraft Corporation, Hartford, Conn.

Filed Oct. 20, 1970, Ser. No. 82,291
Int. Cl.³ B05D 5/00
U.S. Cl. 427—283 25 Claims

1. A process for preparing a catalyst for decomposing hydrazine-base monopropellants, comprising:

(a) contacting a high surface area carrier with an alcohol solution of a salt of a precious metal selected from the group consisting of salts of iridium, ruthenium, and mixtures thereof, to deposit from about ½ to 8% by weight of the precious metal contained in the selected salt, based on the total weight of catalyst, on the exterior surface only of the carrier; and

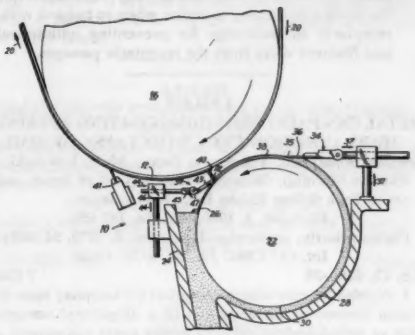
(b) reducing the precious metal on the exterior surface to an active pure metal by contact with a fluid-reducing agent selected from the group consisting of hydrogen and hydrogen-inert gas mixtures.

4,324,820

METHOD AND APPARATUS FOR COATING A PAPER WEB

Scott B. Weldon, San Mateo, Calif., assignor to St. Regis Paper Company, New York, N.Y.

Filed Jul. 18, 1980, Ser. No. 170,050
Int. Cl.³ B05D 1/02
U.S. Cl. 427—420 28 Claims



1. The method of applying liquid coating material to a moving web of substrate material which comprises:

(a) forming on a moving surface at a position subjacent the web of substrate material a moving sheet of liquid coating material of substantially uniform velocity across its leading edge; and

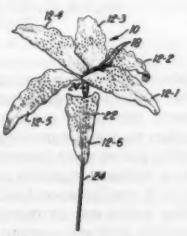
(b) positioning a bar in the path of the moving sheet of coating material and subjacent the web of substrate material to deflect the leading edge of coating material upwardly from its course of travel so as to move in the direction of the substrate material and to form a free standing jet curtain of sufficient height and width to impinge on and coat the substrate material.

4,324,821

ARTIFICIAL FLOWER AND METHOD FOR MAKING THE SAME

Samuel Heineman, III, 1400 Mill Creek Rd., Gladwyne, Pa. 19035

Filed Dec. 30, 1980, Ser. No. 221,518
Int. Cl.³ A41G 1/00
U.S. Cl. 428—24 12 Claims



1. An artificial flower comprising a plurality of petals, each petal having a wire filament extending therefrom,

an elongated receptacle having a plurality of through passages extending axially thereof, the wire filament of said petals being received in said passages and having tip ends extending a distance beyond said receptacle remote from their associated petals, at least some of the passages in said receptacle being disposed in predetermined circular array

as viewed from an end of said receptacle to thereby hold the petal filament wires and their associated petals in corresponding order of array about a floral axis in the whorl semblance of a natural flower, and

a main stem wire received in and extending through one receptacle passage, the tip ends of said wire filaments being twisted in a convoluted course about said stem wire, and said convoluted course which said wire filaments follow initiating at locations laterally offset relatively of the floral axis thereby to define when so twisted with the receptacle an anchorage for preventing withdrawal of said filament wires from the receptacle passages.

4,324,822

METAL CAN PAINT PROVIDING COATING RETAINING HIGH ADHESION EVEN WITH LAPSE OF TIME

Seishichi Kobayashi, Yokohama; Tatsuo Mori, Kawasaki, and Akihiko Morofuji, Ohguchi Nakamachi, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,658

Claims priority, application Japan, Jul. 6, 1979, 54/85016

Int. Cl.³ C08G *59/14, 59/20, 59/24*

U.S. Cl. 428—35 **7 Claims**

1. A paint for cans which comprises (1) an epoxy resin component formed by condensation of a dihydroxyl compound with an epihalohydrin and (2) a curing agent component, said epoxy resin component containing terminal α-glycol groups at a concentration of 0.05 to 0.60 equivalents per Kg of the resin, and terminal epoxy groups at a concentration of 0.20 to 1.80 equivalents per Kg of the resin.

4,324,823

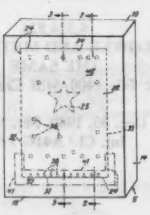
SELECTIVE TAMPER RESISTANCE FOR ON-PACKAGE PEELABLE PREMIUMS

George C. Ray, III, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,720

Int. Cl.³ G09F *3/00*; B32B *3/00, 27/14*

U.S. Cl. 428—43 **12 Claims**



1. In a container formed from laminated packaging material which comprises a relatively rigid substrate and a more pliable outer ply adhered thereto by a water soluble laminant and including a section manually removeable therefrom, said section having utility, per se, apart from said container and being defined by a tear outline comprising a series of cuts through said outer ply in a configuration having a starting edge for initiating peeling action and an oppositely disposed trailing edge interconnected with said starting edge by opposed side edges, a release coating applied between the underside of said section and said laminant in a pattern to render areas of said section non-adherent to said substrate, said pattern defining voids in said release coating spaced apart and extending along said starting edge enabling adherance of said section to said substrate at said voids, said voids being in shapes enabling selected degrees of bonding between said section and said substrate as peeling of said section progresses from said leading edge into the interior areas upon application of moisture to the exterior surface of said section at said leading edge.

4,324,824

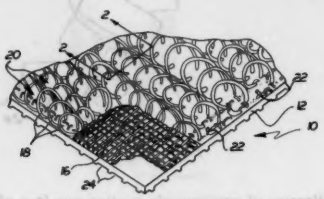
TUFTED PILE FLOOR COVERING WITH PILING OF COATED FIBROUS MATERIAL

Daniel S. Narens, Massilon, and Harold Reuben, Akron, both of Ohio, assignors to The Akro Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 936,370, Aug. 24, 1978, abandoned. This application May 29, 1980, Ser. No. 154,131

Int. Cl.³ D03D *27/06*; D05C *17/02*

U.S. Cl. 428—92 **14 Claims**



1. A floor covering composite having a base layer for contacting a floor and a pile portion adapted to be trod upon and comprising:

a fluid impermeable, flexible polymeric base layer adapted to contact a floor surface;

an intermediate woven primary pile backing supported on the upper surface of said base layer; and

a looped piling material tufted into said intermediate primary pile backing, the piling having exposed loops above said backing and piling portions projecting below said backing, the piling portions below said backing being embedded in said flexible polymeric base layer, said piling being formed from threads having a reinforcing inner fibrous core and an exterior poly(vinyl chloride) coating, said inner fibrous core having a tensile strength greater than the tensile strength of said exterior coating, said piling portions below said backing being mechanically locked with said base layer.

4,324,825

SEPARATING WALL

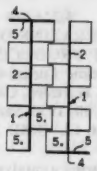
Charles Denkinger, 18, Rue Henri-Mussard, (P.O. Box 145) 1211, Geneva 17, Switzerland

Filed Oct. 17, 1979, Ser. No. 85,748

Claims priority, application Switzerland, Oct. 20, 1978, 10859/78

Int. Cl.³ B32B *3/02, 3/30*

U.S. Cl. 428—99 **7 Claims**



1. A partition for use in an interlocking relationship with a plurality of said partitions so as to be useful in the separation and classification of documents therebetween, said partition comprising:

a pair of opposed first and second surfaces separated by at least one transverse edge portion, said first and second surfaces being substantially uninterrupted and having a continuous surface substantially corresponding with the size of said documents; and

a plurality of tab members disposed along said transverse edge portion, said tab members having adjoining end

portions alternately projecting from said transverse edge portion towards said first and second surfaces, respectively, said tab members projecting towards said first surface being located in a first common plane passing through said first surface and said tab members projecting towards said second surface being located in a second common plane passing through said second surface, said first and second planes being located in a common plane perpendicular to said first and second surfaces.

4,324,826

FINISHING AND SEALING STRIPS

Helmut Ginster, Viersen, Fed. Rep. of Germany, assignor to Draftex Development, A.G., Zug, Switzerland

Filed Dec. 23, 1980, Ser. No. 219,871

Claims priority, application United Kingdom, Feb. 22, 1980, 06100/80

Int. Cl.³ E06B *7/16*

U.S. Cl. 428—122 **3 Claims**

1. A channel-shaped finishing and sealing strip, comprising channel-shaped resilient material defining two opposite inside wall surfaces, a base and a mouth and having embedded within it a channel-shaped flexible reinforcing carrier, and

lips attached to and running longitudinally along the strip and projecting inwardly from both opposite inside wall surfaces and inclined therefrom towards the base, there being four substantially equidistantly spaced relatively small lips on one said wall surface and two substantially equidistantly spaced relatively larger said lips on the other wall surface,

one of the relatively smaller lips on the other of the wall surfaces being positioned along the edge of that wall surface adjacent the said mouth.

4,324,827

WATER-PROOF, FUSE-BONDING FABRIC

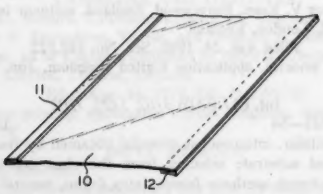
Tsutomu Obayashi, Tokyo, and Hideyuki Hiraoka, Musashino, both of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,250

Claims priority, application Japan, Jan. 17, 1979, 54/4731[U]; Feb. 28, 1979, 54/25036[U]; Mar. 24, 1979, 54/34689[U]; Apr. 16, 1979, 54/46519[U]; Sep. 29, 1979, 54/126139[U]; Nov. 5, 1979, 54/ 142043[U]

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—192 **21 Claims**



1. A water-proof, fuse-bonding fabric which comprises a water-proof fabric including a fabric substrate and at least one coating layer which is formed on at least one surface of said fabric substrate and which comprises a water-proofing agent not capable of providing an adhering activity when a high frequency wave treatment or heating treatment is applied thereto, and which fabric is characterized by at least one fuse-bonding region formed on at least one surface of said water-proof fabric, in which region said surface is partially coated with a polymeric fuse-bonding agent capable of providing an adhering activity when a high frequency wave treatment or heating treatment is applied thereto, said fuse-bonding region forming a pattern which extends longitudinally along said water-proof fabric.

4,324,828

STRUCTURE OF POSITIVE PLATE OF ENCLOSED TYPE BATTERY

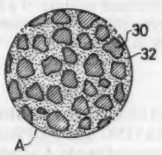
Noboru Ebato; Toshiki Kahara, and Kohki Tamura, all of Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Jun. 6, 1980, Ser. No. 157,001

Claims priority, application Japan, Jun. 29, 1979, 54-81335

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—209 **7 Claims**



1. A structure for a positive plate of an enclosed type of battery comprising a combination of:

a plurality of compact particles made of a compactly aggregated composite agent containing an active material for the positive plate; and

a plurality of coarse particles, smaller and less dense than the compact particles, made of said composite agent which has been aggregated at a pressure lower than that used to prepare the compact particles;

the compact particles being disposed in the positive plate in such a fashion that passages between the compact particles are filled with the smaller, less dense coarse particles.

4,324,829

LAMINATE FILM STRUCTURES FROM CHLORINATED POLYETHYLENES

Ronald J. Hayes, Sarnia, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 946,246, Sep. 27, 1978, abandoned, which is a continuation of Ser. No. 822,130, Aug. 5, 1977, abandoned. This application Apr. 9, 1980, Ser. No. 138,613

Int. Cl.³ B32B *7/02, 27/08*

U.S. Cl. 428—215 **8 Claims**

1. A laminate film structure comprising, in a planar coextensive relationship, (A) an amorphous first outer layer of linear chlorinated olefin polymer containing from about 25 to about 50 weight percent of chemically combined chlorine and having a thickness of from about 0.005 to about 0.05 of an inch; (B) a crystalline internal layer of linear chlorinated olefin polymer containing from about 5 to about 15 percent by weight of chemically combined chlorine and having a thickness of from about 0.005 to about 0.03 of an inch, said internal layer being a film formed from a linear chlorinated high density olefin polymer, said polymer, in particulate form, having a flowability, measured as angle of repose of from about 24° to about 28°, a bulk density in the range of from about 25 to about 35 pounds/-cubic foot, a surface area in the range of from about 2 to about 4 square meters/gram, particles sizes predominantly in the

range of from about 300 to about 600 microns and a porosity sufficient to provide an average free volume within individual particles in the range of from about 20 to about 40 volume percent based on total particle volume, said polymer being chlorinated while in particulate form in a heterogeneous system at a temperature of less than about 90° C., said internal layer having a heat of fusion of from about 20 to about 40 calories/gram; and (C) an amorphous second outer layer of the nature of said first outer layer, said second outer layer being disposed ajacent to said internal layer and remote from said first outer layer.

4,324,830

DIETHYNYLBENZENE-ETHYLNYLPYRENE COPOLYMERS

Norman Bilow, Encino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 17, 1980, Ser. No. 207,829

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—257 **4 Claims**

1. In a carbon-carbon composite comprising a structure of interwoven graphite fibers impregnated with a matrix resinous precursor, the improvement wherein said resinous matrix material is a copolymerized mixture of a diethynylbenzene monomer and an ethynylpyrene monomer in a monomer weight ratio between about 1:9 to 9:1.

4,324,831

FORMED STRUCTURES BASED ON SYNTHETIC FIBERS AND HAVING SOUNDPROOFING PROPERTIES

Paolo Parrini; Vittorio Ciaccia; Guglielmo Corrieri, and Gian P. Righi, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 894,258, Apr. 7, 1978, abandoned, which is a continuation of Ser. No. 743,418, Nov. 19, 1976, abandoned, which is a continuation of Ser. No. 631,524, Nov. 13, 1975, abandoned. This application Mar. 30, 1979, Ser. No. 25,712

Claims priority, application Italy, Nov. 14, 1974, 29435 A74

Int. Cl.³ B32B *27/12*; D04H *1/58*

U.S. Cl. 428—288 **7 Claims**

1. Homogeneous agglomerates having anti-acoustical properties and an apparent density comprised between 0.04 and 0.5 g/cc, said agglomerates consisting essentially of mixtures of fibrils or fibrids of thermoplastic polymers having a surface area greater than 1 m^2/g, and in the range 4.5 m^2/g to 7.5 m^2/g and a binder therefor selected from the group consisting of animal or vegetable glues, synthetic resins and thermoplastic polymers which are compatible with the polymer of which the fibrils or fibrids of the agglomerate are formed and have a melting temperature lower than the melting temperature of the fibrils or fibrids, the weight ratio between the fibrils or fibrids and binder being comprised between about 95:5 and about 50:50.

4,324,832

METHOD OF IMPREGNATING WEB STRUCTURES WITH A SYNTHETIC RESIN

Helmut Moroff, Muehltal-Trautheim; Hanns Boessler, Darmstadt; Hans Hauser, Muehltal, and Gerhard Ladisich, Gernsheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 18, 1980, Ser. No. 113,219

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903172

Int. Cl.³ B44D *1/44*; B05D *3/02, 3/12*; B32B *27/00*

U.S. Cl. 428—289 **12 Claims**

1. A method for making a synthetic veneer, which method comprises impregnating a fibrous web structure with an agent consisting essentially of an aqueous dispersion of a finely divided synthetic resin free of self-crosslinking groups but comprising a plurality of groups capable of external crosslinking reactions with an aminoplast resin, said dispersion further having a water-soluble aminoplast resin dissolved therein, and then drying the impregnated web structure at a temperature from 60° C. to 200° C. out of contact with other objects in a single drying step directly to produce said synthetic veneer, said synthetic resin being thermoplastically deformable and in a non-crosslinked condition at the beginning of the drying step but entering into crosslinking reactions with said aminoplast resin during drying.

12. A synthetic veneer made by the method of claim 1.

4,324,833

WET PROCESS MAT BINDER

Ben J. Yau, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 27, 1979, Ser. No. 79,397

Int. Cl.³ C08L *3/02*; D08N *5/00, 3/12*

U.S. Cl. 428—290 **10 Claims**

1. A wet process mat binder comprising an aqueous solution of a phenolic resin, a methylated melamine formaldehyde resin and a polyvinyl alcohol, said aqueous solution having a pH within the range of from about 3.5 to about 6.5.

4,324,834

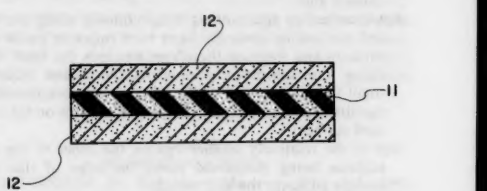
INSULATION MEANS AND METHOD

Edward J. Page, Hampton, and James E. Rock, Norfolk, both of Va., assignors to NRG Research Laboratories, Inc., Newport News, Va.

Filed Jun. 5, 1980, Ser. No. 156,864

Int. Cl.³ B32B *5/16, 5/18, 9/04*

U.S. Cl. 428—312.6 **3 Claims**



1. A composite insulation product having insulating qualities greater than the sum of the qualities of the individual portions comprising: at least two layers of sodium silicate coated expanded perlite type ceramic insulation; and at least one layer of urethane foam type insulation disposed adjacent to and between said ceramic insulation whereby an insulated product having superior insulating qualities is provided.

4,324,835

CELLULAR INTUMESCENT MATERIALS

Christopher V. Keen, Burntwood, England, assignor to Dunlop Limited, England

Filed Apr. 24, 1980, Ser. No. 143,522

Claims priority, application United Kingdom, Jun. 5, 1979, 19521/79

Int. Cl.³ B32B *3/02, 5/20, 7/02*

U.S. Cl. 521—54 **13 Claims**

1. A cellular, intumescent material obtained by treating an open-celled substrate selected from the class consisting of polyether-based urethane foams, latex foams, natural rubbers and synthetic rubbers with a flexible, intumescable polymeric material, said flexible, intumescable polymeric material being one which, on exposure to a flame, melts, foams and solidifies to a foamed carbonaceous char, whereby said open-celled

substrate becomes surrounded with an intumescent foam layer, said intumescable polymeric material comprising (A) a binder and (B) an intumescent component, said intumescent component (B) comprising a carbonific element different from said binder (A) and a spumific element.

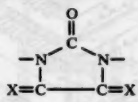
4,324,836

POLYMERS CHARACTERIZED BY 1,3-IMIDAZOLIDINE-1,3-DIYL RINGS PLASTICIZED WITH AROMATIC NITRILES

Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 11, 1980, Ser. No. 158,193
Int. Cl.³ C08K 5/18; B32B 27/04, 27/22, 27/28
U.S. Cl. 428—336 25 Claims

1. A stable meltable composition comprising heterocyclic polymers characterized in the repeating units by the tri-substituted 1,3-imidazolidine-1,3-diyl ring:



wherein X=O or NH, provided at least one X is O and a plasticizing amount of aromatic nitrile.

4,324,837

SELF-BONDING MAGNET WIRE

Masayoshi Miyake, Nagoya, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 27, 1980, Ser. No. 163,458
Claims priority, application Japan, Jun. 27, 1979, 54-81952
Int. Cl.³ B32B 15/00, 27/00; H01B 7/00
U.S. Cl. 428—375 22 Claims

1. A self-bonding magnet wire, comprising:

an insulated conductor; and

a coating over said insulated conductor of an enamel composition consisting essentially of a thermoplastic linear polyurethane prepared by reacting a glycolic component comprising (a) polyoxyalkylene glycol, (b) alkylene glycol, and (c) aromatic diisocyanate, and baking the coated insulated conductor, wherein the molar ratio of components (a), (b) and (c) is such that $0.92 \leqq (c)/\{(a)+(b)\} \leqq 1.01$, and $0.1 \leqq (a)/\{(a)+(b)\} \leqq 1.0$, wherein (a) is the number of moles of polyoxyalkylene glycol represented by the formula $HO-(CH_2)_nO_mH$ and (b) is the number of moles of alkylene glycol represented by the formula $HO-CH_2)_lOH$, and the values of n, m, and l are such that the value of the equation $\{(mn+m-1)\times(a)+1\times(b)\}/\{(a)+(b)\}$ is in the range of from 4.0 to 8.5.

4,324,838

DRY POWDER COMPOSITIONS OF VERMICULITE LAMELLAE AND ADDITIVES

Denis G. Ballard, Littleton; Richard M. Charnah, Thornaby; John F. Droughton, Tarvin, and Graham R. Rideal, Handbridge, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 14, 1979, Ser. No. 66,766
Claims priority, application United Kingdom, Aug. 17, 1978, 33722/78
Int. Cl.³ B32B 5/16
U.S. Cl. 428—402 19 Claims

1. A free-flowing essentially dry powder composition comprising at least 10% by weight vermiculite lamellae said vermiculite lamellae being obtained from vermiculite which has been swollen by the action of aqueous solutions of salts and delaminated by mechanical shearing of the swollen granules to yield platelets having a thickness of less than one tenth of a micrometer.

4,324,839

SILICONE RESIN COATING COMPOSITION

Robert B. Frye, Menands, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 964,911, Nov. 30, 1978, Pat. No. 4,277,287. This application Mar. 9, 1981, Ser. No. 241,653
Int. Cl.³ B32B 27/36, 9/04
U.S. Cl. 428—412 15 Claims

1. A solid substrate having at least one surface coated with an improved aqueous coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition having a pH of from 7.1 to about 7.8, wherein the improvement comprises the intimate admixture of a small amount effective to control flow of a polysiloxane polyether copolymer with said composition.

4,324,840

ADSORPTION DECAFFEINATION

Saul N. Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,725
Int. Cl.³ A23F 3/38, 5/22
U.S. Cl. 426—422 10 Claims

1. An improved method for decaffeinating an aqueous caffeine-containing solution comprising the steps of:

(a) contacting an aqueous caffeine-containing solution with a solid caffeine adsorbent coated with a thin layer of a liquid, water-immiscible, caffeine-specific solvent;

(b) maintaining the aqueous caffeine-containing solution in contact with the solid caffeine adsorbent for a time sufficient for at least a portion of the caffeine to be extracted from the aqueous solution and adsorbed by the solid caffeine adsorbent; and

(c) separating the aqueous caffeine-containing solution from the solid caffeine adsorbent.

4,324,841

LITHOGRAPHIC SUBSTRATES

Jen-chi Huang, Ossining, N.Y., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 69,482, Aug. 24, 1979, Pat. No. 4,242,417, which is a continuation-in-part of Ser. No. 937,222, Aug. 28, 1978, Pat. No. 4,201,836. This application Aug. 15, 1980, Ser. No. 178,656
The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.
Int. Cl.³ B32B 15/04; B05D 3/12; G03C 1/94
U.S. Cl. 428—457 22 Claims

1. An aluminum sheet provided with at least one surface suitable for lithography by a method which comprises the steps of:

a. mechanically graining said surface; and,

b. immersing said aluminum sheet in a saturated aqueous solution of an aluminum salt of a mineral acid for a period of time from about 5 seconds to about 5 minutes at about 25° C. to about 110° C.

4,324,842

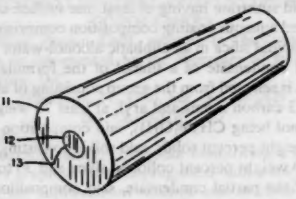
SUPERCONDUCTING WIRE WITH IMPROVED STRAIN CHARACTERISTICS

Thomas Luhman, Westhampton Beach; Carl J. Klamut, East Patchogue; Masaki Suenaga, Bellport, and David Welch, Stony Brook, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 966,709, Dec. 5, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,439

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—614 5 Claims



1. A superconductor wire having improved resistance to loss of current-carrying capacity when subjected to strain, said superconductor wire comprising at least one filament of a material possessing superconducting properties, said filament being encased in a matrix consisting essentially of up to about 0.2 weight percent Be and bronze having a coefficient of thermal expansion greater than that of said filament, said matrix containing beryllium in an effective concentration sufficient to induce and maintain said filament under greater radial and axial compression than that provided by a bronze matrix without the beryllium addition.

4. A superconductor wire as described in claim 1, 2 or 3 in which said beryllium is present in said matrix in the range of 0.01 to 0.2 weight percent.

4,324,843

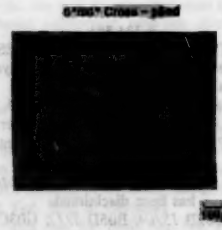
CONTINUOUS LENGTH SILICON CARBIDE FIBER REINFORCED CERAMIC COMPOSITES

John J. Brennan, Portland, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 13, 1980, Ser. No. 121,081

Int. Cl.³ B32B *5/02, 5/08, 15/08*

U.S. Cl. 428—697 8 Claims



1. A multilayered fiber reinforced ceramic composite comprising a plurality of substantially titanium-free ceramic layers selected from the group consisting of (a) aluminosilicate, (b) lithium aluminosilicate, (c) magnesium aluminosilicate and (d) mixtures thereof, each layer reinforced with a plurality of unidirectional, continuous length silicon carbide fibers, each layer having an axial flexural strength greater than 70,000 psi (4.83×10^8 NT/M^2) and a high fracture toughness, exemplified by a critical stress intensity factor greater than 10×10^3 psi (inch)$^{\frac{1}{2}}$.

4,324,844

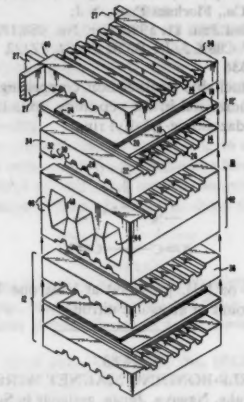
VARIABLE AREA FUEL CELL COOLING

Richard E. Kothmann, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1980, Ser. No. 144,090

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—26 5 Claims



1. An improved electrochemical cell system of the type wherein two process fuel cells connected electrically are separated by a cooling module and a fluid oxidant is fed in parallel through process channels in said fuel cells and through cooling passages in said cooling module, said cooling passages having an inlet and an outlet, the improvement comprising:

said cooling passages being of a variable surface area per unit length which generally increases from said inlet to said outlet.

4,324,845

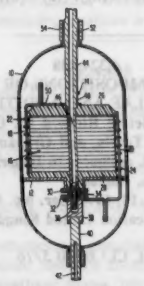
METAL-OXIDE-HYDROGEN CELL WITH VARIABLE CONDUCTANT HEAT PIPE

Joseph F. Stockel, Rockville, Md., assignor to Communications Satellite Corp., Washington, D.C.

Filed Jun. 30, 1980, Ser. No. 164,382

Int. Cl.³ H01M *10/50*

U.S. Cl. 429—101 11 Claims



1. In a rechargable metal oxide-hydrogen cell having an outer shell, an electrode stack within said shell having positive and negative electrodes positioned on an alignment member,

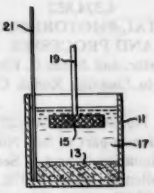
positive and negative bus bars coupling respective positive and negative electrodes to like conductive terminals, the improvement comprising a variable conductance heat pipe including at least a portion of said alignment member, said heat pipe coupling the interior of the electrode stack to a radiator outside said shell, and a working fluid within said heat pipe.

4,324,846

NEGATIVE ELECTRODE COMPOSITION

Thomas D. Kaun, New Lenox, and Albert A. Chilenskas, Western Springs, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 12, 1980, Ser. No. 177,323
Int. Cl.³ H01M *4/40, 4/46*
U.S. Cl. 429—112 **19 Claims**



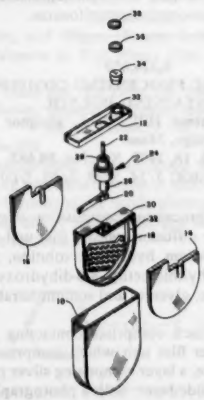
1. A negative electrode composition for use in a secondary electrochemical cell to provide overcharge protection comprising a lithium-aluminum alloy in combination with a mixture of ternary alloys sufficient to provide a discontinuity in the cell voltage when the cell is substantially fully charged, said mixture of ternary alloys comprising lithium-aluminum nickel and a second ternary alloy selected from the group consisting of lithium aluminum-iron alloy and lithium-aluminum-cobalt alloy wherein said lithium-aluminum-nickel alloy is present in an amount less than 50% by weight of said mixture of ternary alloys.

4,324,847

LITHIUM ANODE ASSEMBLIES AND CELL CONSTRUCTION

Lee F. Athearn, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 18, 1980, Ser. No. 188,512
Int. Cl.³ H01M *4/76*
U.S. Cl. 429—181 **19 Claims**



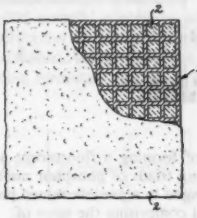
1. In a lithium anode assembly for electrochemical cells, the assembly comprising a lithium anode element having generally opposing sides and a peripheral contact surface area extending around the element between the opposing sides; a peripheral frame member comprised of a material non-reactive with the contents of the cell, the frame peripherally contacting and enclosing the anode element at the peripheral contact surface area thereof, the improvement comprising a metallized surface area on the surface of the frame member which contacts the anode element.

4,324,848

POSITIVE ELECTRODE FOR LEAD ACID BATTERY

Fritz G. Will, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,647
Int. Cl.³ H01M *4/56*
U.S. Cl. 429—228 **10 Claims**



1. A positive electrode for use in a secondary lead-sulfuric acid electrolyte cell or battery comprised of a grid supporting an adherent external layer of PbO_2, said grid being comprised of an electrically conducting substrate having an adherent protective at least substantially pinhole-free shield of electrically conducting material, said shield being composed of a coating of semiconducting metal oxide, or a composite of at least a substantially pinhole-free external coating of semiconducting metal oxide and at least a substantially pinhole-free coating of metal intermediate to the substrate and semiconducting oxide coating, said sulfuric acid electrolyte having a substantially deleterious effect on said substrate, but having no significant deleterious effect on said shield.

4,324,849

IMAGEWISE ACCELERATING EQUILIBRATION IN ULTRASONOGRAPHIC RECORDING

Donald L. Kerr, Rochester, and Gary M. Russo, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 56,499, Jul. 11, 1979, abandoned. This application Jun. 20, 1980, Ser. No. 161,521
Int. Cl.³ G03C *5/26;* G01N *29/00*
U.S. Cl. 430—3 **19 Claims**

1. In a process of recording an ultrasonic exposure pattern employing an ultrasonographic element comprised of a support and a recording layer unit capable of producing an ultrasonographic record as a function of diffusion to a transport liquid, the recording layer unit being beneath the support and in contact with the transport liquid, said process comprising

imagewise ultrasonically exposing below 100 watt-sec/cm² the recording layer unit through the transport liquid to accelerate diffusion from the recording layer unit into the transport liquid in exposed areas, thereby producing in the recording layer unit an ultrasonographic record,

the improvement comprising

further accelerating diffusion in ultrasonically exposed areas by establishing a temperature differential within the transport liquid adjacent the recording layer unit so that the transport liquid remote from the recording layer unit is at

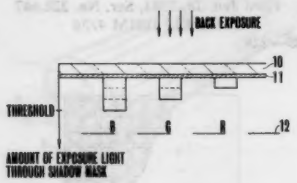
a relatively lower temperature than the transport liquid contacting the recording layer unit.

4,324,850

METHOD OF FORMING A FLUORESCENT SCREEN FOR A COLOR PICTURE TUBE

Yoshifumi Tomita; Masahiro Nishizawa; Hiroshi Yokomizo, and Hiromitu Nakai, all of Mobara, Japan, assignors to Hitaci, Ltd., Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,694
Claims priority, application Japan, Apr. 18, 1979, 54-46649
Int. Cl.[3] G03C 5/00
U.S. Cl. 430—24 8 Claims



1. A method of forming a fluorescent screen for a color picture tube having triads of phosphor materials of three primary colors arranged in a predetermined pattern on the inner surface of a panel comprising the steps of:

forming on the inner surface of the panel a photosensitive film which exhibits stickiness when exposed to a threshold amount of light;

exposing to light at threshold from a light source first locations of the photosensitive film where a first color phosphor material of the primary three colors should occupy through a shadow mask mounted to the panel;

exposing to the light second locations of the photosensitive film where a second color phosphor material should occupy through the shadow mask with the amount of light which is below the threshold;

exposing to the light third locations of the photosensitive film where third color phosphor material should occupy through the shadow mask with the amount of light which is below the said threshold and below the amount of light exposed on the said second locations;

dismounting the shadow mask and depositing the first color phosphor material onto the photosensitive film;

subjecting the panel to a first back exposure which brings only the second locations of the photosensitive material to stickiness;

depositing the second color phosphor material onto the photosensitive film;

subjecting the panel to a second back exposure which brings the third locations of the photosensitive material to stickiness; and

depositing the third color phosphor material onto the photosensitive film.

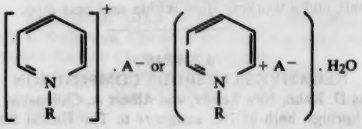
4,324,851

POSITIVE COLOR TONERS

Chin H. Lu, Webster; Dominic F. Sherony, Fairport, and Peter F. Erhardt, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1979, Ser. No. 105,836
Int. Cl.[3] G03G 9/10
U.S. Cl. 430—106 6 Claims

1. A colored developing composition capable of being charged positively, the composition being comprised of a resin, colored cyan, yellow, and magenta pigments selected from copper tetra-4-(octadecylsulfonomido)phthalocyanine, yellow FGL, Color Index pigment yellow 97, and 2,9-dimethyl substituted quinacridone, a single common carrier consisting of an oxidized steel core coated with polyvinylidene fluoride, and from about 0.1 percent to about 10 percent of an alkyl pyridinium compound or its corresponding hydrate of the formula:



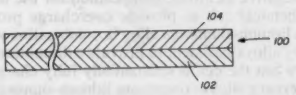
wherein R is a hydrocarbon radical containing from about 8 to about 22 carbon atoms, and A is an anion selected from halide, sulfate, sulfonate, nitrate, borate, or phosphate.

4,324,852

TRANSITION METAL PHOTOREDUCTION SYSTEMS AND PROCESSES

Anthony Adin, Rochester, and James C. Fleming, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 846,239, Oct. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 618,186, Sep. 30, 1975, which is a continuation-in-part of Ser. No. 461,057, Apr. 15, 1974. This application Jun. 7, 1979, Ser. No. 46,532
Int. Cl.[3] G03C 1/52, 1/00, 1/72, 5/24
U.S. Cl. 430—178 20 Claims



1. A radiation-sensitive element comprising

(A) a support, and

(B) on the support, a radiation-sensitive layer comprising, in admixture,

a reducible, radiation-sensitive inert cobalt(III) complex free of a sensitizable anion,

and a photoreductant capable of forming in the absence of a cobalt(III) complex, upon exposure to activating radiation longer than 300 nanometers in wavelength, a reducing agent which forms a redox couple when associated with the cobalt(III) complex, said photoreductant being selected from the group consisting of disulfides, diazoanthrones, diazophenanthrones, aromatic azides, carbazides, and diazosulfonates.

4,324,853

PHOTOGRAPHIC PROCESSING COMPOSITION CONTAINING POLYOL

Michael Berger, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 18, 1979, Ser. No. 58,683
Int. Cl.[3] G03C 5/54, 5/38, 5/30, 7/00
U.S. Cl. 430—245 19 Claims

9. A photographic processing composition adapted for use with an additive color diffusion transfer film unit which comprises an aqueous sodium hydroxide solution, tetramethyl reductic acid, 2-methylthiomethyl-4,6-dihydroxypyrimidine, hydroxyethyl cellulose, glycerol and sodium tetraborate decahydrate.

10. The method which comprises contacting an exposed silver diffusion transfer film unit which comprises a support carrying on one surface, a layer comprising silver precipitating nuclei, and a silver halide layer; with a photographic processing composition adapted for use with a silver diffusion transfer film unit which comprises an aqueous alkaline solution, a silver halide developing agent, a silver halide solvent and glycerol,

wherein said glycerol is present at a level of about 0.1–1.0 g per 10 cc of said processing composition.

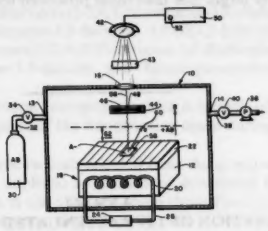
11. The method of claim **10** wherein said glycerol is present at a level of about 0.2 g per 10 cc of said processing composition.

4,324,854

DEPOSITION OF METAL FILMS AND CLUSTERS BY REACTIONS OF COMPOUNDS WITH LOW ENERGY ELECTRONS ON SURFACES

Jesse L. Beauchamp, and Patricia M. George, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 3, 1980, Ser. No. 126,874
Int. Cl.³ B05D *3/06*; H05K *3/18*
U.S. Cl. 430—296 **18 Claims**



1. A method for depositing a thin film on the surface of a substrate comprising the steps of:

placing said substrate in a deposition zone;

introducing a first precursor gas containing a first compound capable of electron capture dissociation into said deposition zone;

generating low energy electrons at or near the surface of said substrate;

dissociatively capturing said electrons with said first compound resulting in dissociation of said first compound into a coordinately unsaturated negatively charged reactive first deposition species and a first dissociation species;

depositing said first deposition species on the surface of said substrate; and

removing said first dissociation species from said deposition zone.

4,324,855

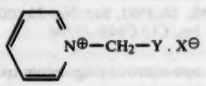
PROCESS FOR DEVELOPING A SILVER HALIDE EMULSION

Yasushi Oishi, and Shigeo Hirano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1980, Ser. No. 140,923
Claims priority, application Japan, Apr. 17, 1979, 54-46949
Int. Cl.³ G03C *1/36, 5/24*
U.S. Cl. 430—378 **25 Claims**

21. A photographic light-sensitive material comprising a support having provided thereon at least one unfogged internal latent image-forming silver halide photographic emulsion layer for producing direct positive images associated with a compound of the formula II:

II



in an amount of about 1×10^{-4} to 6×10^{-3} mole per mole of silver halide wherein X represents an anion, Y represents an acyl group or a cyano group an the acyl group and the 3-, 4- or 5-position of the pyridinium ring may be optionally substituted, with the proviso that said acyl group does not comprise a sulfonyl group.

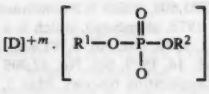
4,324,856

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Satoshi Kawakatsu; Shigeto Hirabayashi; Hidetaka Ninomiya, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Oct. 7, 1980, Ser. No. 194,799
Claims priority, application Japan, Oct. 11, 1979, 54-131376
Int. Cl.³ G03C *1/34, 1/06*
U.S. Cl. 430—566 **5 Claims**

1. A photographic material containing silver halide in at least one layer of structural layers coated on a support wherein at least one of the structural layers contains a compound represented by a following formula:



wherein D represents a nitrogen-containing organic base or a compound containing quaternary nitrogen atom, and R^1 and R^2 individually represent a hydrogen atom, a substituted or non-substituted alkyl group, alkenyl group, cycloalkyl group, phenyl group, or hetero ring group; or R^1 and R^2 may combine to form a ring, m is an integer from 1 to 5, and R^1 and R^2 are not both hydrogen at the same time.

4,324,857

Patent Not Issued For This Number

4,324,858

STABILIZATION OF CHOLINESTERASE, DETECTOR KIT USING STABILIZED CHOLINESTERASE, AND METHODS OF MAKING AND USING THE SAME

Louis H. Goodson, Kansas City, Mo., and Alan Goodman, Edgewood, Md., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jun. 16, 1980, Ser. No. 160,027
Int. Cl.³ C12Q *1/46*
U.S. Cl. 435—20 **19 Claims**

1. A method for providing a treated porous material impregnated with a substantially stabilized cholinesterase comprising the steps of:

(a) uniformly distributing the cholinesterase through an aqueous medium buffered to a pH greater than about 6 but less than about 9 with a buffering amount of a zwitterionic buffering agent,

(b) impregnating a porous material with the aqueous medium containing said cholinesterase, and

(c) drying the resulting impregnated porous material to remove substantially all of the physically bound water and thereby provide said treated porous material, having substantially no measurable water vapor pressure in a closed system.

4,324,859

APPARATUS AND ASSOCIATED METHODS FOR USE IN MICROBIOLOGICAL, SEROLOGICAL, IMMUNOLOGICAL, CLINICAL-CHEMICAL AND SIMILAR LABORATORY WORK

Rolf Saxholm, Box 3, 1362 Billingstad, Norway

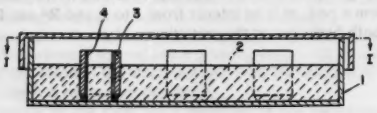
Continuation-in-part of Ser. No. 731,103, Oct. 8, 1976, Pat. No. 4,140,582, which is a continuation of Ser. No. 602,745, Aug. 7, 1975, Pat. No. 3,985,608, which is a continuation of Ser. No. 414,939, Nov. 12, 1973, abandoned, which is a division of Ser. No. 33,594, May 1, 1970, Pat. No. 3,791,930. This application Feb. 16, 1979, Ser. No. 12,905

Claims priority, application Norway, May 3, 1969, 691832

The portion of the term of this patent subsequent to Feb. 12, 1974, has been disclaimed.

Int. Cl.³ C12Q *1/20*

U.S. Cl. 435—33 65 Claims



1. Apparatus for carrying out biological and chemical diffusion tests in microbiological, serological, immunological, and clinical-chemical work, in which at least one active substance is contacted with a substrate containing an agent, the reactivity of the agent and active substance being the subject of investigation, said apparatus comprising a container containing the substrate, a divided carrying body with respective separated sections in sealed contact within the container such that the sections form separate regions with isolated substrate portions in each of said regions, said carrying body penetrating into said substrate in each of said regions and means supported by said carrying body for introducing said active substance into respective isolated substrate portions where the carrying body penetrates into the substrate by discharging said active substance into the penetrated substrate portions by diffusion whereby the action in said substrate is restricted to said separate regions.

4,324,860

LACTATE DEHYDROGENASE MUTANTS OF *STREPTOCOCCUS MUTANS*

Jeffrey D. Hillman, Jamaica Plain, Mass., assignor to Forsyth Dental Infirmary for Children, Boston, Mass.

Division of Ser. No. 880,499, Feb. 23, 1978, Pat. No. 4,133,875. This application Oct. 6, 1978, Ser. No. 949,371

Int. Cl.³ C12N *15/00*

U.S. Cl. 435—172 15 Claims

1. A method of manufacture of a mutant composition useful in the control of the incidence and severity of dental caries, which method comprises:

(a) culturing *Streptococcus mutans* in a suitable nutrient for growing cells of the culture; and

(b) isolating and purifying selected mutant strains, to provide a mutant-strain composition consisting essentially of a substantially biologically pure mutant strain characterized by bright red colonies, when grown on glucose tetrazolium medium spheroidal, gram-positive cells occurring in pairs and chains and having a mutation in the structural gene for the enzyme, lactate dehydrogenase.

7. A biologically pure culture of a mutant of *Streptococcus mutans* strain BHT-2 (str) having a single point mutation in the structural gene for lactate dehydrogenase, being gram positive, having spheroidal cells occurring in pairs and chains and producing on glucose tetrazolium medium bright red colonies of relatively larger size than those produced by the parent strain.

4,324,861

PREPARATION OF LIVE ATTENUATED MUMPS VIRUS FOR A VACCINE

Takayoshi Kan, Kanonji, Japan, assignor to Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

Filed Dec. 6, 1979, Ser. No. 100,957

Claims priority, application Japan, May 4, 1979, 54-055094

Int. Cl.³ C12N *7/08*

U.S. Cl. 435—237 8 Claims

1. A method of preparing a live attenuated mumps virus for a vaccine comprising:

incubating a wild mumps virus strain in a living cell selected from the group consisting of embryonated hen's egg chorio-allantoic membrane, chick embryo fibroblast and human diploid cell for 1–18 passages sufficient to attenuate the virus, and

subjecting the thus attenuated virus to successive cultivation in a living cell selected from the group consisting of embryonated hen's egg amnion, embryonated hen's egg chorio-allantoic membrane and human diploid cell to propagate the virus.

4,324,862

BASIC (MGO) NON-AQUEOUS PLASTIC REFRACTORY MIXTURE

Kenneth A. Gebler, Munster, Ind., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 13, 1981, Ser. No. 234,082

Int. Cl.³ C04B *35/04*

U.S. Cl. 501—109 3 Claims

1. A substantially non-aqueous magnesium oxide refractory composition comprising:

(a) 50–90% particulate magnesium oxide

(b) 6–44% by weight refractory filler

(c) 3–12% by weight of a water miscible glycol

(d) 1–8% by weight molasses.

4,324,863

FIRE-PROOFED INSULATING MATERIAL FOR AN ELECTRIC CABLE

Jean P. Bonicel, Lyons; Christian Cottevielle, Montreuil; Michel Maucolot, Nozay, and Madeleine Prigent, Marcoussis, all of France, assignors to Societe Anonyme dite: Les Cables de Lyon, Lyons, France

Filed Sep. 5, 1979, Ser. No. 72,814
Claims priority, application France, Nov. 7, 1978, 78 31467
Int. Cl.³ C08V 9/00
U.S. Cl. 521—85 7 Claims

1. A fire-proofed insulating material for an electric cable, said material including:

(a) a matrix made of a synthetic polymer selected from the group consisting of copolymers of propylene and ethylene, high-density polyethylene, polypropylene, and thermoplastic polyesters;

(b) a fire-proofing agent selected from the group consisting of 3,9-di(2,3-dibromopropoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro(5,5)-undecane-3,9-dioxide, 3,9-di(2,2-[dibromomethyl]-3-chloropropoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro(5,5)undecane-3,9-dioxide and hexabromocyclododecane;

(c) an inorganic antimony compound which is capable of reacting with the bromine of the fire-proofing agent during combustion and

(d) a generator of free radicals selected from the group consisting of branched aliphatic hydrocarbons containing four or six carbon atoms in the aliphatic chain thereof and containing phenyl substituents, decomposing only at a temperature higher than the extrusion temperature of said matrix, and being able to split in a homolytic way between two carbon atoms at said higher temperature.

4,324,864

PROCESS FOR THE PRODUCTION OF CELLULOSE-SILICATE PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 221,432, Dec. 30, 1980, which is a continuation-in-part of Ser. No. 169,973, Jul. 18, 1980, which is a continuation-in-part of Ser. No. 884,135, Mar. 7, 1978, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Jun. 26, 1981, Ser. No. 277,994
Int. Cl.³ C08J 9/00
U.S. Cl. 521—100 20 Claims

1. The process for the Production of polyurethane lignin-cellulose silicate foam by the following steps:

(a) mixing and reacting 1 to 100 parts by weight of an oxidized silicate compound, selected from the group consisting of oxidized alkali metal silicate, oxidized alkaline earth metal silicate, oxidized alkaline earth metal silicate, oxidized mono alkali metal silicic acid, oxidized silicic acid and mixtures thereof, 50 parts by weight of plant cellulose particles, selected from the group consisting of cotton, wood cellulose, regenerated cellulose, sulfate cellulose produced by the Kraft process, sulfite cellulose, mechanical pulp cellulose, vegetable cellulose, cellulose esters and semi-chemical cellulose, a salt-forming compound selected from the group consisting of hydrochloric acid and sulfuric acid and in an amount wherein the mixture of the components has a pH of 1.5 to 5 after the reaction is complete, thereby producing lignin-cellulose silicate product containing impregnated hydrated silica;

(b) mixing 50 parts by weight of an organic polyisocyanate or polyisothiocyanate, selected from the group consisting of aliphatic, cycloaliphatic, araliphatic, aromatic and heterocyclic polyisocyanates and mixtures thereof, up to 100% by weight of a curing agent, based on weight of the reactants, 1 to 100 parts by weight of the dried lignin-cellulose silicate product containing impregnated hydrated silica, up to 10% by weight of an activator, up to 50% by weight of a blowing agent consisting of a liquid boiling in the range of −25° C. to +80° C., up to 20% by weight of a foam stabilizer and up to 20% by weight of an emulsifying agent are mixed and reacted, thereby

(c) producing a polyurethane lignin-cellulose silicate foam.

4,324,865

POLYURETHANE FOAMS HAVING LOW DISCOLORATION

Michael J. Reale, Brewster, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 17, 1981, Ser. No. 255,142
Int. Cl.³ C08G 18/14
U.S. Cl. 521—107 10 Claims

1. A method of making flame retardant polyurethane foams having improved scorch and surface discoloration properties by reacting an organic polyol and an organic isocyanate in the presence of a halogenated phosphoric acid ester flame retardant and phenothiazine, wherein the improvement comprises; adding to the reaction 4,4'thio-bis-(6-tertiary butyl meta cresol) in an amount effective to reduce scorch and surface discoloration.

4,324,866

THERMOPLASTIC ELASTOMER COMPOSITION

Minoru Furuichi; Chikara Honma, and Noriaki Ando, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 180,427
Claims priority, application Japan, Aug. 27, 1979, 54-108126
Int. Cl.³ C08L 9/00, 23/20
U.S. Cl. 521—140 7 Claims

1. An uncrosslinked thermoplastic elastomer composition comprising:

(A) 35–95% by weight of a 1,2-polybutadiene having a 1,2-configuration content of at least 70%, a crystallinity of 5–40% by weight and of at least 0.7 dl/g as measured at 30° C. in toluene,

(B) 1–20% by weight of an isobutylene homopolymer or an isobutylene-isoprene copolymer,

(C) 5–40% by weight polybutadiene rubber having a 1,4-configuration content of at least 80%, and

(D) 0–30% by weight of at least one member selected from the group consisting of isoprene rubber, natural rubber, acrylonitrile-butadiene rubber, styrene-butadiene rubber and ethylene-propylene type rubbers.

4,324,867

PROCESS FOR THE PREPARATION OF MOLDED POLYURETHANE-POLYUREA ELASTOMERS AND MOLDED PARTS PREPARED THEREBY

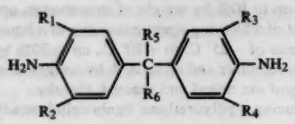
John T. Patton, Jr., Wyandotte, and John P. Rupert, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 6, 1980, Ser. No. 194,503
Int. Cl.³ C08G 18/14
U.S. Cl. 521—159 9 Claims

1. A process for preparing molded polyurethane-polyurea elastomers comprising reacting an organic polyisocyanate and a reactive polyol composition by reaction injection molding techniques, said reactive polyol composition comprising

(a) a polyol having an equivalent weight of from 700 to 4,000 and a functionality from 2 to 6; and

(b) from 15 to 40 parts by weight, based upon 100 parts of (a) plus (b), of a reactive aromatic ciamine which is soluble in said polyol at use temperatures and concentrations, has a pK_b value greater than 10, and has the following structural formula:



wherein R_1, R_2, R_3, and R_4 are individually selected from the group consisting of hydrogen and alkyl radicals of 1 to 4 carbon atoms, and at least one of the alkyl radicals in each ring is a non-linear alkyl radical selected from the group consisting of isopropyl, isobutyl, and tertiary butyl radicals, and wherein R_5 and R_6 are individually selected from the group consisting of hydrogen and alkyl radicals of 1 to 4 carbon atoms.

4,324,868

PROCESS AND APPARATUS FOR PREPARATION OF VINYL POLYMERS

Toru Maeda, Toyama, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,194

Claims priority, application Japan, Jun. 19, 1979, 54-83727[U]; Jun. 25, 1979, 54-80000

Int. Cl.³ C08F *20/14*

U.S. Cl. 525—54 **5 Claims**

1. In a process for the preparation of vinyl polymers by bulk or solution polymerization comprising continuously introducing a polymerization starting material containing at least one vinyl monomer, at least one polymerization initiator and at least one polymerization regulator into a polymerization reactor of the complete mixing type, polymerizing the monomer while mixing the contents of the polymerization reactor whereby a reaction mixture containing polymer is formed, keeping the temperature of the reaction mixture at a constant level between 100° and 200° C. by removing the heat of polymerization with cooling means provided inside or outside of the reactor, maintaining the polymer content of said reaction mixture at 50 to 80% by weight, withdrawing a stream of reaction mixture containing polymer from the polymerization reactor, introducing the reaction mixture withdrawn from the polymerization reactor into a separation zone where volatiles are separated from the reaction mixture, said separated volatiles being recycled to be used as a part of the monomer for the polymerization starting material, the improvement which comprises dividing said stream of reaction mixture into a first stream and a second stream, feeding said first stream to said separation zone, continuously mixing fresh polymerization starting material with said second stream and recycling the resulting mixture to said polymerization reactor through an opening located at a position corresponding to ¼ or less of the total height from the bottom to the top of said reactor.

4,324,869

POLYARYLATE BLENDS WITH ETHYLENE-ALKYL ACRYLATE COPOLYMERS

Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,898

Int. Cl.³ C08L *33/08, 67/02, 73/00*

U.S. Cl. 525—68 **35 Claims**

1. A molding composition comprising a blend of:

(a) a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid, and

(b) an ethylene-ethyl acrylate copolymer.

4,324,870

SCORCH-SAFE ACCELERATION OF URETHANE VULCANIZATION OF UNSATURATED RUBBERS

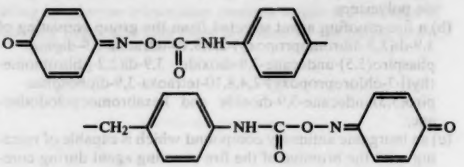
Yong S. Rim, Woodbridge; Walter Nudenberg, Newton, and Arnold N. Johnson, Southbury all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,950

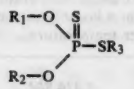
Int. Cl.³ C08F *8/34, 8/40*

U.S. Cl. 525—127 **8 Claims**

1. In a method of curing an unsaturated rubber which is a conjugated diene homopolymer or a copolymer containing at least 50% by weight of units derived from a conjugated diene by heating the rubber in admixture with an adduct of nitrosophenol and methylene bis(4-phenylisocyanate) of the formula



to form urethane cross-links, the improvement comprising adding to the rubber, prior to curing, as a scorch delay cure catalyst, a derivative of dithiophosphoric acid of the formula



wherein R_1 and R_2 are alkyl groups having at least 12 carbon atoms or are connected together and form an alkylene group having at least 2 carbon atoms, and R_3 is hydrogen or phenethyl.

4,324,871

HOT MELT ADHESIVE COMPOSITIONS CONTAINING A TERPENE-PHENOLIC RESIN, ETHYLENE COPOLYMER AND ALKENYL SUCCINIC ANHYDRIDE

Vikramkumar Acharya, and Pallavoor R. Lakshmanan, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 174,296, Jul. 31, 1980, abandoned. This application Jan. 28, 1981, Ser. No. 229,204

Int. Cl.³ C08L *23/08;* C08K *5/09*

U.S. Cl. 525—149 **9 Claims**

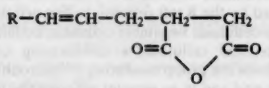
1. A hot melt adhesive composition consisting essentially of:

(a) 10–30 weight % of an alkenyl succinic anhydride,

(b) 20–60 weight % of an ethylene copolymer, and

(c) 10–40 weight % of a tackifying resin;

said alkenyl succinic anhydride having the structure:



where R is an alkyl group containing at least about 15 carbon atoms; said ethylene copolymer having polymerized therein at least 40 weight % polymerized ethylene and the balance one or more polymerized monomers from the group consisting of vinyl acetate, acrylic and methacrylic acid and alkyl esters of acrylic and methacrylic acid; and said tackifying resin being a terpene-phenolic resin having a Ring and Ball softening point of about 80°–135° C.

4,324,872

ALKALI SOLUBLE BLENDS OF AN IONOMER RESIN AND AN ALKENYL SUCCINIC ANHYDRIDE

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

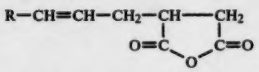
Filed Nov. 24, 1980, Ser. No. 209,812
Int. Cl.³ C08F 275/00
U.S. Cl. 525—274 6 Claims

1. An extrudable, alkali-soluble polymeric composition consisting essentially of an intimate fusion blend of;

(1) 100 parts by weight of an ionomer resin, and

(2) about 5 to 900 parts by weight of an alkenyl succinic anhydride;

said ionomer resin being a metal salt of an ethylene-acid copolymer which is a copolymer of ethylene and acrylic or methacrylic acid having an acid content of about 1–10 mol % and having a high load melt index of at least about 1.0 and a normal load melt index of up to about 50; and said alkenyl succinic anhydride having the structure:



where R is an alkyl group containing about 13 to 49 carbon atoms.

4,324,873

ORGANOSILICON-ORGANOMETAL COMPOSITIONS AS EPOXY CURING CATALYSTS

Moriyasu Wada, Kanagawa; Shuichi Suzuki, Yokohama; Shinichi Sanada, Yokohama, and Shuzi Hayase, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisaha, Kawasaki, Japan

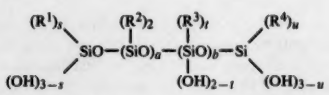
Filed Jun. 11, 1980, Ser. No. 158,456
Claims priority, application Japan, Jun. 21, 1979, 54-77504
Int. Cl.³ C08G 59/68, 59/70
U.S. Cl. 525—507 18 Claims

1. An epoxy resin-based composition, comprising:

an epoxy resin; and

a catalytic amount of a curing catalyst comprising:

(A) at least one organosilicon compound selected from the group consisting of $R_lH_mSi(OH)_n$, wherein R is independently alkyl, phenyl, aralkyl, vinyl, or allyl, l is 1, 2 or 3, m is 0, 1 or 2 and n is 1, 2 or 3 provided the sum of l+m+n is 4 and



wherein R^1, R^2, R^3 and R^4 are each, independently, alkyl, phenyl, vinyl, aralkyl or allyl, at least one of the hydrocarbon radicals being present, s and u are each 0, 1 or 2; t is 0, 1 or 2; and a and b are each 0, 1 or an integer greater than 1; and

(B) at least one organometal compound selected from the group consisting of alkoxide, phenoxide, acyloxide, and chelate compounds of vanadium, aluminum, and iron, and mixtures thereof.

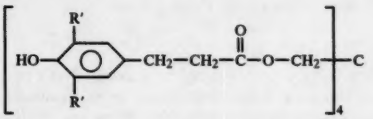
4,324,874

PRODUCTION OF VINYL HALIDE POLYMERS WITH DIALKYL, HYDROXY PHENYL ALKANOIC ESTER OF POLYHYDRIC ALCOHOLS

William F. Cordes, III, East Brunswick; Donald Goodman, Flemington, and Robert S. Miller, Bridgewater all of N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Oct. 8, 1980, Ser. No. 195,275
Int. Cl.³ C08F 2/42, 2/20
U.S. Cl. 526—84 2 Claims

1. In the process for the polymerization of a monomer component selected from the group consisting of vinyl halides and mixtures of a vinyl halide with at least one ethylenically-unsaturated monomer that is copolymerizable therewith, said mixtures containing at least 70% by weight of the vinyl halide, in an aqueous medium at a temperature in the range of 40° C. to 80° C. in the presence of a free radical generating polymerization initiator, the improvement that comprises adding to the polymerization reaction mixture when from about 75% to 90% of the monomer component has been polymerized from 0.02% to 0.05% by weight, based on the weight of the monomer component, of a chain-terminating agent having the structural formula



wherein each R′ represents an alkyl group having 1 to 6 carbon atoms.

4,324,875

METHOD FOR PRODUCING OLEFIN POLYMERS

Masato Harada, Kisarazushi; Sadahiko Yamada, Ichiharashi; Atsushi Suzuki, Ichiharashi, and Jun Masuda, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 21, 1980, Ser. No. 151,795
Claims priority, application Japan, Jun. 1, 1979, 54/68294
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—115 2 Claims

1. In a method for producing α-olefin polymers by homopolymerization or copolymerization of α-olefins in the presence of a catalyst obtained by combining a solid product (III) with an organoaluminum compound, the improvement which comprises employing as said solid product (III) a material obtained by

(a) obtaining a solid product (I) by reacting

(1) a trivalent metal halide selected from the group consisting of anhydrous aluminum chloride and anhydrous ferric chloride, with

(2) a divalent metal hydroxide, oxide, carbonate or a composite compound containing a divalent metal hydroxide, oxide or carbonate or a hydrate of a divalent metal compound, the atom ratio of the divalent metal to the trivalent metal being 0.1 to 20,

(b) obtaining a solid product (II) by reacting

(1) 100 g of said solid product (I) with

(2) 1 to 1000 g of a transition metal compound selected from the group consisting of halides, oxyhalides, alcoholates, alkoxyhalides and acetoxyhalides of a transition metal selected from the group consisting of titanium and vanadium

said reaction being carried out in the presence of 10 to 10,000 g of an electron donor selected from the group consisting of ethers, esters, aldehydes, ketones, carboxylic acids, acid anhydrides, acid amides, amines, nitriles, phosphines, phosphorus oxytrichloride and

thioethers, in a proportion of 2 to 2,000 g of said transition metal compound relative to 100 g of said electron donor to produce a solid product (II),

said reaction being carried out by mixing said solid product (I), said transition metal compound and said electron donor and then heating the mixture at 50° C. to 300° C.,

(c) reacting said solid product (II) with at least two kinds of transition metal compounds consisting of

(1) at least one halogen-containing transition metal compound selected from the group consisting of the halides, oxyhalides, alkoxyhalides and acetoxyhalides of titanium or vanadium and

(2) at least one halogen-free transition metal compound selected from the group consisting of tetraalkyl orthotitanates (tetraalkoxytitaniums), vanadyl trialcoholates and polytitanic acid esters expressed by the general formula $RO-\left[Ti(OR)_2\right]_mR$ wherein m is an integer of 2 or more and the Rs are the same or different kinds of alkyl groups, aryl groups or aralkyl groups,

the ratio of the number of transition metal atoms of (c)(1) to the number of transition metal atoms of (c)(2) being between 10:1 and 1:10,

the total weight of (C)(1) and (C)(2) being between 1 and 1000 g for each 100 g of said solid product (II), thereby producing a solid product (III).

4,324,876

PROCESS FOR THE PRODUCTION OF POLYOLEFINS

Kazuo Matsuura; Takeichi Shiraishi; Etsuo Kawamata, all of Kawasaki; Nobuyuki Kuroda, Yokohama, and Mitsuji Miyoshi, Kanagawa, all of Fed. Rep. of Germany, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,318

Claims priority, application Japan, Dec. 4, 1979, 54-157903

Int. Cl.³ C08F 4/02, 10/00

U.S. Cl. 526—124 **5 Claims**

1. A process for the production of polyolefins which comprises polymerizing or copolymerizing olefins at a temperature of from 20° C. to 300° C. and a pressure of atmospheric to 70 kg/cm^2 in the presence of a catalyst system comprising a solid component and an organometallic compound, said solid component resulting from the mutual contact of

(i) an inorganic magnesium compound selected from the group consisting of MgO, $Mg(OH)_2$, $MgCO_3$, $MgSO_4$, $MgO.SiO_2$, $MgO.Al_2O_3$ and hydrotalcite of a spherical particle size of from 1 to 100 microns,

(ii) a compound represented by the formula $AlX_3.OR'R''$ where X represents a halogen atom; and R′ and R″ represent a hydrocarbon residual group having 1 to 20 carbon atoms) and

(iii) a titanium compound represented by the formula $Ti(OR)_4$ (where R represents a hydrocarbon residual group having 1 to 20 carbon atoms), at a temperature of from 50° C. to 300° C., the ratio of inorganic magnesium compound (i) to compound (ii) being 1 gram to 0.05 to 10 milli-mols, and the amount of titanium compound in said solid component being from 0.5 to 20% by weight,

and said organometallic compound being a compound of a metal of the Groups I to IV of the Periodic Table.

4,324,877

METHOD FOR POLYMERIZING α-OLEFIN

Haruo Ueno, Chiba; Takefumi Yano, Ichihara; Tokuji Inoue, Ichihara; Shigeru Ikai, Ichihara; Masanori Tamura, Ichihara, and Sakae Yuasa, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 19, 1980, Ser. No. 208,302

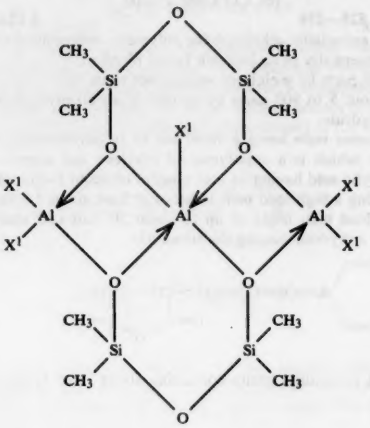
Claims priority, application Japan, Nov. 29, 1979, 54/153626

Int. Cl.³ C08F 4/02, 10/06

U.S. Cl. 526—127 **23 Claims**

1. A method for polymerizing an α-olefin which comprises bringing, in the presence of an organic acid ester, a feed containing at least one α-olefin, having 3 or more carbon atoms, into contact with a catalyst composed of:

a solid catalytic ingredient which has been prepared in such a manner that an aluminosiloxy compound of the formula,



[I]

wherein X^1 represents a chlorine atom, a bromine atom or an iodine atom, is reacted with a Grignard compound of the formula R^1MgX^2[II] wherein R^1 represents an alkyl radical having 1 to 8 carbon atoms and X^2 represents a halogen atom, the resultant solid reaction product is brought into contact with a titanium tetrahalide, the resultant titanium-containing solid product is treated with an organic acid ester, and the treated solid product is brought into contact with a titanium tetrahalide; and

a trialkyl aluminum.

4,324,878

PRODUCTION OF VINYL CHLORIDE POLYMER

Roberto Biaggi, and Massimo Quintini, both of Bergamo, Italy, assignors to Sigma Italiana Prodotti Chimici S.p.A., Bergamo, Italy

Filed Dec. 13, 1979, Ser. No. 103,339

Claims priority, application Italy, Dec. 15, 1978, 30911 A/78

Int. Cl.³ C08F 2/20

U.S. Cl. 526—200 **6 Claims**

1. A process for producing vinyl chloride polymer which comprises polymerizing vinyl chloride monomer in aqueous suspension, in the presence of a free radical catalyst, a primary suspending agent to control the granulometric distribution of the particles of vinyl chloride polymer obtained and selected from the group consisting of water-soluble polyvinyl alcohols, water-soluble modified celluloses, and water-soluble maleic anhydride/vinyl acetate copolymers, and a secondary suspending agent consisting of partially hydrolyzed polyvinyl acetate having a saponification number between 520 and 600 and a viscosity, measured in a 4% methanol solution at 20° C., between 0.5 and 2 cps wherein the ratio of the amount of said primary suspending agent to the amount of said secondary suspending agent is between 1:10 and 10:1.

4,324,879

PROCESS FOR THE PREPARATION OF POLYISOCYANATES CONTAINING ISOCYANURATE GROUPS AND THE USE THEREOF

Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Walter Uerdingen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 69,412, Aug. 24, 1979, abandoned. This application May 19, 1980, Ser. No. 151,005

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839133

Int. Cl.[3] C08G *18/20;* G08G *18/80;* C08G *18/79*

U.S. Cl. 528—45 9 Claims

1. A process for the preparation of clear and substantially colorless or slightly colored, solvent-free polyisocyanates containing isocyanurate groups, having a viscosity of less than about 10,000 mPas at 25° C. and a monomeric diisocyanate content of less than about 3% by weight, comprising partially trimerizing the isocyanate groups of hexamethylene diisocyanate in the presence of at least one quaternary ammonium hydroxide as catalyst and subsequently separating excess, unreacted diisocyanate and solvent which may be used, said process characterized in that an ammonium hydroxide which is hydroxyalkyl substituted at the nitrogen atom is used as the quaternary ammonium hydroxide.

4,324,880

β-HYDROXYBUTYRIC ACID POLYESTERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS STARTING MATERIALS FOR LACQUERS

Rolf Dhein; Knud Reuter; Hans Rudolph, all of Krefeld, and Jörg Pfitzner, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

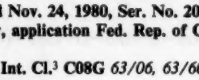
Filed Nov. 24, 1980, Ser. No. 209,392

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948023

Int. Cl.[3] C08G *63/06, 63/60*

U.S. Cl. 528—80 7 Claims

1. Polyesters having a hydroxyl number of from 50 to 400 and containing co-condensed β-hydroxycarboxylic acid units, characterised in that the polyesters contain from 20 to 90% by weight of co-condensed units corresponding to the following formula



in which n has an average value of from 1 to 15, and from 80 to 10% by weight of co-condensed residues of polyols and optionally monohydric alcohols, mono- or polycarboxylic acids and diisocyanates.

4,324,881

PREPARATION OF AMIDE-CONTAINING POLYETHERS

Gerd Blinne, Bobenheim; Rolf Wurmb, Heidelberg, and Franz Schmidt, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

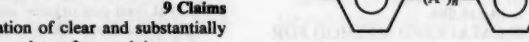
Filed Sep. 9, 1980, Ser. No. 185,606

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940190

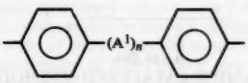
Int. Cl.[3] C08G *65/40*

U.S. Cl. 528—173 6 Claims

1. A process for the preparation of an amidecontaining polyether by polycondensing one or more bisphenols with one or more dihalobenzene compounds in substantially equivalent amounts in the presence of an anhydrous alkali metal carbonate, wherein one or more amide-containing bisphenols of the formula I



where Ar^1 is an aromatic radical of 6 to 12 carbon atoms and Ar^2 is an aromatic radical of 6 to 12 carbon atoms or has the formula II



where A^1 is $—SO_2—$, —CO—, $—C(CH_3)_2—$ or —O— and n is 0 or 1, are used for the polycondensation.

4,324,882

METHOD FOR MAKING POLYIMIDES

Tohru Takekoshi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 19, 1980, Ser. No. 188,755

Int. Cl.[3] C08G *73/10*

U.S. Cl. 528—206 11 Claims

1. A method for making polyimides which comprises

(1) effecting reaction between a $C_{(6-30)}$ aromatic organic dianhydride and a $C_{(2-20)}$ organic diamine in the presence of an effective amount of an alkali metal salt of an oxygenated phosphorus compound, selected from the group consisting of orthophosphates, dihydrogen orthophosphates, hypophosphates, pyrophosphates, metaphosphates, orthophosphites, and arylphosphonates and

(2) recovering the resulting polyetherimide from the mixture of (1).

4,324,883

METHOD FOR MAKING POLYETHERIMIDE USING A PHENOLIC OR CARBOXYLIC ACID CATALYST

Dwain M. White, Schenectady, N.Y., and David G. Keyes, Minneapolis, Minn., assignors to General Electric Company, Schenectady, N.Y.

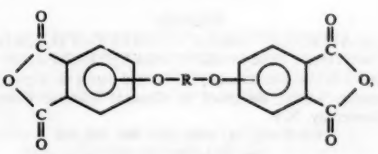
Filed Sep. 19, 1980, Ser. No. 188,754

Int. Cl.[3] C08G *73/10*

U.S. Cl. 528—207 5 Claims

1. A method for enhancing the polymerization rate of polyetherimide polymerized under solution polymerization conditions which comprises

(A) effecting the removal of at least about 90% by weight of water of reaction from a reaction mixture comprising an organic dianhydride of the formula,



an organic diamine of the formula

$$NH_2R^1NH_2,$$

and a substantially inert organic solvent,

(B) adding to the resulting mixture of (A) an effective amount of a polymerization catalyst selected from an arylhydroxide of the formula,

$$R^2OH,$$

and a $C_{(1-20)}$ organic carboxylic acid, and

(C) recovering polyetherimide from the resulting mixture of (B),

where R is a divalent aromatic organic radical having from 6–30 carbon atoms, R^1 is a divalent organic radical selected from R radicals, alkylene radicals having from 2–20 carbon atoms, cycloalkylene radicals, and $C_{(2-8)}$ alkylene terminated polydiorganosiloxane radicals and R^2 is a $C_{(6-13)}$ monovalent aromatic organic radical.

4,324,884

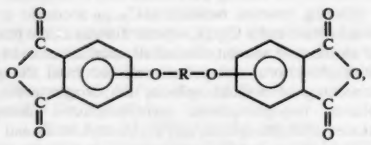
ORGANIC AMINE CATALYZED METHOD FOR MAKING POLYETHERIMIDE

Dwain M. White, Schenectady, N.Y., and David G. Keyes, Minneapolis, Minn., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1980, Ser. No. 190,613
Int. Cl.³ C08G 73/10
U.S. Cl. 528—207 15 Claims

1. A method for making aromatic polyetherimide which comprises

(1) effecting reaction between a $C_{(6-30)}$ aromatic bis(ether anhydride) of the formula,



and a $C_{(3-20)}$ organic diamine of the formula,

$$H_2NR^1NH_2,$$

in the presence of an effective amount of an amine catalyst selected from the class consisting of N-aliphatic aminopyridines, aliphatic secondary diamines, aliphatic tertiary diamines, $C_{(8-20)}$ organic secondary monoamines and $C_{(8-20)}$ organic tertiary monoamines, and

(2) recovering the aromatic polyetherimide from the mixture of (1),

where R is a divalent aromatic organic radical having from 6–30 carbon atoms and R^1 is a divalent organic radical selected from R radicals, alkylene radicals having from 2–20 carbon radicals, cyclo alkylene radicals and $C_{(2-8)}$ alkylene terminated polydiorganosiloxane radicals.

4,324,885

QUATERNARY GROUP VA SALT CATALYZED METHOD FOR MAKING POLYETHERIMIDE

Dwain M. White, Schenectady, N.Y., and David G. Keyes, Minneapolis, Minn., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1980, Ser. No. 190,594
Int. Cl.³ C08G 73/10
U.S. Cl. 528—207 6 Claims

1. A method for making aromatic polyetherimide which comprises,

(1) effecting reaction between a $C_{(6-30)}$ aromatic bisanhydride and a $C_{(2-20)}$ aromatic diamine in the presence of an effective amount of a quaternary salt catalyst of a Group Va element selected from the class consisting of nitrogen and phosphorous, and

(2) recovering the aromatic polyetherimide from the mixture of (1).

4,324,886

ARYLENE SULFIDE POLYMER PREPARED FROM AMINOALKANOATE

James T. Edmonds, Jr., and Lacey E. Scoggins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1980, Ser. No. 147,407
Int. Cl.³ C08G 75/14
U.S. Cl. 528—387 7 Claims

1. A method for producing polymer comprising:

(a) contacting at polymerization conditions a reaction mixture comprising:

(1) at least one polyhalo-substituted aromatic compound,

(2) at least one organic amide as solvent,

(3) at least one alkali metal aminoalkanoate prepared by contacting in the presence of an alkali metal carboxylate a reaction mixture comprising:

(i) at least one alkali metal hydroxide;

(ii) water, and

(iii) at least one lactam; and

(4) H_2S, and

(b) maintaining said reaction mixture at polymerization conditions for a time sufficient to produce polymer.

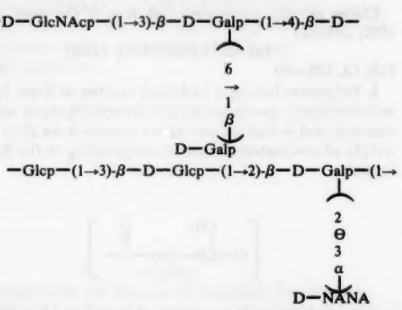
4,324,887

TYPE II GROUP B *STREPTOCOCCI POLYSACCHARIDE*

Dennis L. Kasper, Newton Center, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 934,214, Aug. 16, 1978, Pat. No. 4,207,414. This application Jun. 9, 1980, Ser. No. 157,859
Int. Cl.³ A61K 31/73; C08B 37/00
U.S. Cl. 536—53 1 Claim

1. A polysaccharide antigen in purified form specific to Type II Group B streptococci consisting essentially of repeating units having the following composition:



in which GlcNAcp stand for N-acetyl glucosamine (in the pyranose form), Galp stands for galactose (in the pyranose form), Glcp stands for glucose (in the pyranose form) and α-D-NANA stands for sialic acid, said polysaccharide having a molecular size from about 0.2×10^6 to 6×10^6d.

4,324,888

PROCESS FOR THE PREPARATION OF CHLORODEOXYSUGARS

Elner B. Rathbone, Wokingham, England, assignor to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles

Filed Mar. 5, 1980, Ser. No. 127,307
Claims priority, application United Kingdom, Mar. 9, 1979, 08392/79
Int. Cl.³ C07H 5/02
U.S. Cl. 536—122 7 Claims

1. A process for the preparation of a chlorodeoxy derivative of a reducing aldose having a primary hydroxy group in an exocyclic —CH_2OH group, in which the said primary hy-

droxy group is replaced by a chlorine atom to give a chlorodeoxy reducing sugar with a free anomeric centre, characterised in that the free reducing sugar is reacted with a reagent comprising an N,N-dialkyl (methaniminium) chloride obtained by reacting an N,N-dialkyl formamide with a chlorinating agent and such chlorination is followed by a mild hydrolytic work up.

4,324,889

2,5-INTER-O-PHENYLENE-3,4-DINOR-6,9α-EPOXY-6β-5-IODO-PGF$_1$ AMIDES

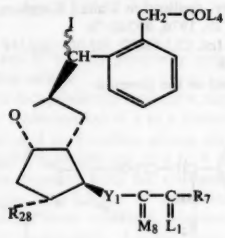
Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,597

Int. Cl.^{3} C07D *307/935*

U.S. Cl. 542—426 **1 Claim**

1. A prostacyclin intermediate of formula VIII



wherein R_{28} is —OR_{10}, —CH_2OR_{10}, hydroxy, hydroxymethyl, or hydrogen, wherein R_{10} is a blocking group removable by mild acidic hydrolysis;

wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—Ch=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—,

wherein M_8 is α-R_5:β-OR_{10} or α-OR_{10}:β-R_5, wherein R_5 is hydrogen or methyl and R_{10} is as defined above, or α-R_5:β-OH or α-OH:β-R_5, wherein R_5 is as defined above;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 is

(1)—$(CH_2)_m$—CH_3, wherein m is an integer from one to 5, inclusive;

(2) phenoxy;

(3) phenoxy substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(4) phenyl;

(5) phenyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(6) phenylmethyl, phenylethyl, or phenylpropyl; or

(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein L_4 is

(1) amino of the formula —$NR_{21}R_{22}$, wherein R_{21} and R_{22} are

(a) hydrogen;

(b) alkyl of one to 12 carbon atoms, inclusive;

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(d) aralkyl of 7 to 12 carbon atoms, inclusive;

(e) phenyl;

(f) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;

(g) carboxyalkyl of 2 to 5 carbon atoms, inclusive;

(h) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;

(i) cyanoalkyl of 2 to 5 carbon atoms, inclusive;

(j) acetylalkyl of 3 to 5 carbon atoms, inclusive;

(k) benzoylalkyl of 7 to 11 carbon atoms, inclusive;

(l) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;

(m) pyridyl;

(n) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;

(o) pyridylalkyl of 6 to 9 carbon atoms, inclusive;

(p) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or alkoxy of one to 3 carbon atoms, inclusive;

(q) hydroxyalkyl of one to 4 carbon atoms, inclusive;

(r) dihydroxyalkyl of one to 4 carbon atoms, inclusive, or

(s) trihydroxyalkyl of one of 4 carbon atoms, inclusive; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(2) cycloamino selected from the group consisting of

(a) pyrrolidino,

(b) piperidino,

(c) morpholino,

(d) piperazino,

(e) hexamethyleneimino,

(f) pyrrolino,

(g) 3,4-didehydropipridinyl, or

(h) pyrrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl substituted by one or two alkyl of one to 12 carbon atoms, inclusive;

(3) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and R_{21} is other than hydrogen, but otherwise as defined above; or

(4) sulfonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined in (3).

4,324,890

CEPHALOSPORIN INTERMEDIATES

Burton G. Christensen, Scotch Plains; Sandor Karady, Elizabeth; Lovji D. Cama, Edison; Meyer Sletzinger, North Plainfield, all of N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 149,364, Jun. 2, 1971, Pat. No. 4,297,488. This application Apr. 30, 1980, Ser. No. 145,069

Claims priority, application United Kingdom, Apr. 30, 1971, 29158/71

Int. Cl.^{3} C07D *501/18*

U.S. Cl. 544—021 **4 Claims**

1. The compound 3-A-7-X-7-azido-3-cephem-4-carboxylic acid wherein X is bromine, chlorine or iodine; A is methyl, hydroxymethyl, chloromethyl, bromomethyl, or fluoromethyl, mercaptomethyl, methoxymethyl, n-propoxymethyl, methylthiomethyl, acetoxymethyl, propionyloxymethyl, benzoyloxymethyl, (p-chlorobenzoyl)oxymethyl, (p-methylbenzoyl)oxymethyl, pivaloyloxymethyl, (1-adamantyl)carbox-

ymethyl, butanoyloxymethyl, carbamoyloxymethyl, (N-methylcarbamoyl)oxymethyl, (N-ethylcarbamoyl)oxymethyl, [N-(2-chloroethyl)carbamoyl]oxymethyl, (N-phenylcarbamoyl)oxymethyl, (N-p-sulfophenylcarbamoyl)oxymethyl, p-carboxymethylphenylcarbamoyloxymethyl, methoxycarbonyloxymethyl, isobutanoyloxymethyl, cyclobutylcarbonyloxymethyl, carbamoylthiomethyl, (ethoxythiocarbonyl)-thiomethyl, (n-propoxythiocarbonyl)thiomethyl, (cyclopentanoxythiocarbonyl)thiomethyl, N,N-diethylthiocarbamoylthiomethyl, N-methylpiperazinium-1-thiocarbonylthiomethyl, N,N-dimethylpiperzinium-1-thiocarbonylthiomethyl, 2-furoylthiomethyl, isothiouroniummethyl, (5-methyl-1,3,4-thiadiazol-2-yl)-thiomethyl, p-tolylsulfonylthiomethyl, mesyloxymethyl, 1-methyl-1,2,3,4-tetrazolyl-5-thiomethyl, tosyloxymethyl, sulfamoyloxymethyl, 1-naphthoyloxymethyl, 2-furylacetoxymethyl, cinnamoyloxymethyl, p-hydroxycinnamoyloxymethyl, p-sulfocinnamoyloxymethyl and 1R:2S-epoxypropylphosphonyloxymethyl, or pyridinium methyl; and the carboxylic acid protecting derivatives thereof wherein the derivative group is methyl, t-butyl, trichloroethyl, allyl, propargyl, benzyl, diphenylmethyl, o-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, acetoxymethyl, pivaloyloxymethyl, phenacyl, trichloroethoxy carbonyl, trimethylsilyl or tributyltin.

4,324,891

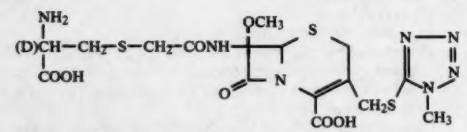
PROCESS FOR THE PRODUCTION OF A 7-METHOXYCEPHALOSPORINE DERIVATIVE

Katsuyoshi Iwamatsu, Yokohama; Takashi Tsuruoka, Kawasaki; Kazuko Mizutani; Katsumi Kawaharajyo, both of Yokohama; Tadahiro Watanabe, Sagamihara, and Shigeharu Inouye, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,604
Int. Cl.³ C07D *501/04*
U.S. Cl. 544—021 **1 Claim**

1. A process for the production of the compound of the formula (I)

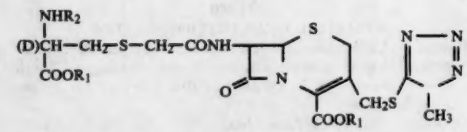
(I)



which comprises the steps of:

(a) reacting one molar equivalent of a protected cephem compound of the formula (II)

(II)



wherein R_1 is a known carboxyl-protecting group and R_2 is a known amino-protecting group, with 1 to 3 molar equivalents of t-butyl hypochlorite and 2 to 6 molar equivalents of lithium methoxide in, dry tetrahydrofuran at a temperature of −40° C. to −100° C.

(b) admixing the resulting reaction mixture containing the 7α-methoxylation product formed in the step (a) immediately after the 7α-methoxylation reaction is completed in step (a), with a tri-alkyl phosphite and acetic acid at least in such amounts sufficient to decompose the quantities of the t-butyl hypochlorite and lithium methoxide which are remaining unreacted in said reaction mixture, respectively, at the same temperature as the reaction temperature at which the 7α-methoxylation reaction was conducted in the step (a) and

(c) removing in a known manner the residual three protecting groups, namely the two residual carboxyl-protecting groups (R_1) and the residual amino-protecting group (R_2) from said 7α-methoxylation product to produce the compound of the formula (I).

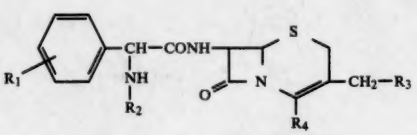
4,324,892

7-(N-SUBSTITUTED-2-PHENYLGLYCINAMIDO)-3-SUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takashi Kamiya, Suita; Tsutomu Teraji, Toyonaka; Keiji Hemmi, Kyoto, and Jiro Goto, Mino, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 824,910, Aug. 15, 1977, Pat. No. 4,172,198. This application Jun. 4, 1979, Ser. No. 45,011
Claims priority, application United Kingdom, Aug. 17, 1976, 34302/76; Nov. 29, 1976, 49748/76
Int. Cl.³ C07D *501/46, 501/34*
U.S. Cl. 544—28 **5 Claims**

1. A compound of the formula:



wherein

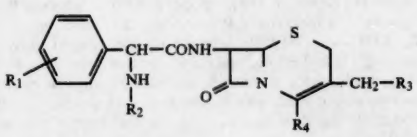
R_1 and R_3 are each hydrogen,

R_2 is alkanoyl (C_1–C_2) substituted with pyridyloxy, and

R_4 is carboxy

and pharmaceutically acceptable salts thereof.

3. A compound of the formula:



wherein

R_1 is hydroxy,

R_2 is alkanoyl (C_1–C_2) substituted with dihydropyridyloxy having oxo, halogen and alkyl (C_1–C_6),

R_3 is alkanoyloxy (C_1–C_6) or carbamoyloxy, and

R_4 is carboxy

and pharmaceutically acceptable salts thereof.

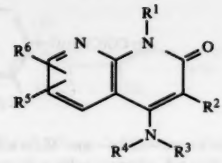
4,324,893

4-AMINO-3-CARBOXY OR CYANO-1,2-DIHYDRO-2-OXO-1,8-NAPHTHYRIDINE DERIVATIVES

Anthony C. Scotese, King of Prussia, and Arthur A. Santilli, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 31,255, Apr. 18, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,600
Int. Cl.³ C07D *413/04*
U.S. Cl. 544—127 **42 Claims**

1. A compound of the formula:



in which

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, alken-(3,4,5 or 6)-yl of 3 to 6 carbon atoms or alkyn-(3,4,5 or 6)-yl of 3 to 6 carbon atoms;

R^2 is —CN, $—CO_2H$, $—CO_2R^7$ where R^7 is alkyl of 1 to 6 carbon atoms, $—CONHNH_2$ or

where R^8 and R^9 are independently hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 and R^4 are independently hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, dialkylaminoalkyl of 4 to 8 carbon atoms, alkanoyl of 2 to 4 carbon atoms, haloalkanoyl of 2 to 4 carbon atoms, or when taken together with the nitrogen atom to which they are attached, R^3 and R^4 complete a heterocyclic group selected from aziridinyl, azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, 4-lower alkyl-piperazinyl, 4-phenylpiperazinyl, 4-[1-ethyl-1,2-dihydro-7-methyl-2-oxo-1,8-naphthyridine-4-yl-3-carboxylic acid ethyl ester]-piperazinyl, 4-carb(lower)alkoxy-piperazinyl, morpholinyl, thiomorpholinyl or a ring substituted lower alkyl analogue thereof;

R^5 and R^6 are independently hydrogen; alkyl of 1 to 4 carbon atoms, halo, alkylamino of 1 to 4 carbon atoms, or alkoxy of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,324,894

AMINOISOQUINOLINE DERIVATIVES

Pal Benko; Andras Gelleri; Gyorgy Hajos; Andras Messmer; Laszlo Pallos; Lujza Petocz; Ibolya Kosoczky; Katalin Grasser; Peter Gorog, and Eniko Szirt nee Kiszelly, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

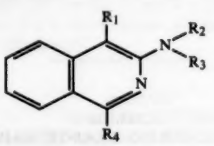
Filed Apr. 10, 1980, Ser. No. 138,843

Claims priority, application Hungary, Apr. 11, 1979, EE 2647

Int. Cl.³ C07D *413/04, 403/14*

U.S. Cl. 544—128 **4 Claims**

1. A compound of the formula (I)



(I)

wherein

R_1 represents a hydrogen atom or a C_{1-4} alkyl group,

R_2 represents a hydrogen atom,

R_3 represents a hydrogen atom,

R_4 represents a morpholinyl group or a piperazinyl group substituted with a pyridyl group, and

pharmaceutically acceptable acid addition salts and quaternary ammonium derivatives thereof.

4,324,895

NOVEL PROCESS FOR PRODUCING PYRIMIDINE NUCLEOSIDES AND NOVEL PYRIMIDINE NUCLEOSIDES OBTAINED THEREBY

Masanao Matsui, Tokyo, and Tomoya Ogawa, Musashino, both of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

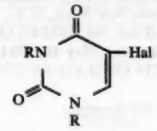
Filed Oct. 28, 1976, Ser. No. 735,777

Claims priority, application Japan, Dec. 4, 1975, 50/144637; Jan. 5, 1976, 51/180; Mar. 15, 1976, 51/27836; Mar. 15, 1976, 51/27837; May 11, 1976, 51/53463

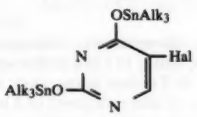
Int. Cl.³ C07D *405/04*

U.S. Cl. 544—313 **17 Claims**

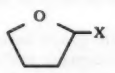
1. A process for producing pyrimidine nucleoside represented by the following general formula:



wherein R stands for a hydrogen atom or a 2-tetrahydrofurane residue but both R's cannot simultaneously be hydrogen atoms, and Hal represents a fluorine atom, which comprises reacting bis(tri-lower alkylstannyl)-5-halogenouracil represented by the following general formula:



wherein Alk stands for a lower alkyl radical and Hal has the same meaning as above; with 2-substituted tetrahydrofurane represented by the following general formula:



wherein X stand for a halogen atom, a lower alkyloxy, lower aralkyloxy, lower alkylcarbonyloxy or arylcarbonyloxy radical; at a temperature within a range from −50° to 100° C.

4,324,896

6-(SUBSTITUTED PHENOXY)-2-DI-(SUBSTITUTED PHENOXY)METHYL PYRIDINES

Sudarshan K. Malhotra, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

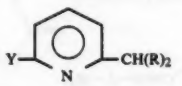
PCT No. PCT/US80/01226, § 371 Date Sep. 18, 1980, § 102(e) Date Sep. 18, 1980, PCT Pub. No. WO82/01003, PCT Pub. Date: Apr. 1, 1982

PCT Filed Sep. 18, 1980, Ser. No. 266,016

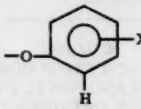
Int. Cl.³ C07D *213/46, 491/04, 491/14*

U.S. Cl. 546—301 **10 Claims**

1. A compound corresponding to the formula



wherein Y represents R'; R represents



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkyl sulfonyl of 1 to 4 carbon atoms, trifluoromethyl, chloro, fluoro or bromo; n represents an integer of 0 to 2 or X_n represents 3,4-methylenedioxy and R' represents R with the proviso that R and R' can be the same or different.

4,324,897

1,2,3 OXADIAZOLIUM SALTS

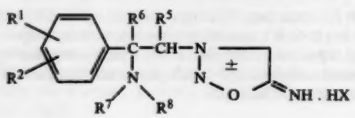
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,043, Oct. 2, 1980, Pat. No. 4,289,885. This application May 18, 1981, Ser. No. 264,892

Int. Cl.³ C07D *413/06, 271/04*

U.S. Cl. 548—125 **3 Claims**

1. A compound of the formula:



in which

R^1 and R^2 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, perfluoroalkyl of 1 to 3 carbon atoms, nitro, alkanoyl of 2 to 4 carbon atoms, or alkoxycarbonyl of 2 to 4 carbon atoms;

R^5 and R^6 are, independently, hydrogen or methyl;

R^7 and R^8 are, independently, alkyl of 1 to 4 carbon atoms, or when taken with the nitrogen atom to which they are attached, form a piperidinyl, pyrolidinyl, morpholinyl, N-alkyl piperazinyl in which the alkyl group contains from 1 to 6 carbon atoms or N-phenylpiperazinyl group; and

X is the anion of a strong acid having a pKa below 2; or a pharmaceutically acceptable acid addition salt thereof.

4,324,898

HETEROCYCLIC COMPOUNDS USEFUL AS COLOR PHOTOGRAPHIC MATERIAL

Paul Tschopp, Düdingen, Switzerland, assignor to Ciba Geigy AG, Basel, Switzerland

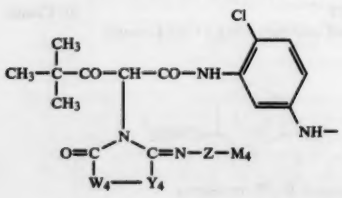
Division of Ser. No. 895,579, Apr. 12, 1978, Pat. No. 4,206,278. This application Aug. 30, 1979, Ser. No. 71,329

Claims priority, application Switzerland, Apr. 29, 1979, 5378/77

Int. Cl.³ C07D *277/04*

U.S. Cl. 548—184 **3 Claims**

1. A yellow coupler of the formula



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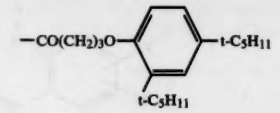
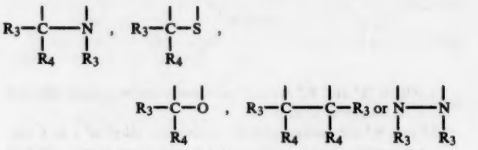


in which Z is —CO— or —SO_2— and M_4 is alkyl having 1 to 5 carbon atoms, benzyl, phenyl, which is unsubstituted or substituted by alkyl having 1 to 3 carbon atoms, chlorine and-/or nitro, or, if Z is —CO—, alkoxy having 2 to 5 carbon atoms, monoalkylamino having 1 to 5 carbon atoms, carbalkoxy having 1 to 3 carbon atoms in the alkoxy moiety or carboxamido which is N-substituted or N,N-disubstituted by alkyl having 1 to 3 carbon atoms and/or by phenyl, and —W-$_4$—Y_4— is the formulae



in which R_3 is hydrogen, alkyl having 1 to 5 carbon atoms, acyl having 2 to 5 carbon atoms or phenyl and R_4 is alkyl having 1 to 5 carbon atoms or phenyl.

4,324,899

2-AMINO-5-CYANOTHIAZOLES AND THEIR PREPARATION

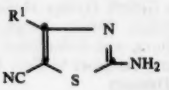
Mark D. Frishberg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 55,092, Jul. 5, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,812

Int. Cl.³ C07D *277/20*

U.S. Cl. 548—190 **9 Claims**

1. A compound of the formula



wherein R^1 is selected from hydrogen; straight or branched alkyl of 1–20 carbons which may be substituted with 1–3 halogens; phenyl and phenyl substituted with 1–3 halogens, straight or branched alkyl of 1–20 carbons, straight or branched alkoxy of 1–20 carbons, cyano, nitro or trifluoromethyl; 2-thiophene; and α-pyridine.

4,324,900

3-AMINO-4-C-CARBOXY-2,3,4,6-TETRADEOXY-D-ARABINO-HEXOSE TRIMETHYLENE DITHIOACETAL

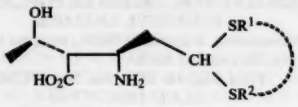
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1981, Ser. No. 248,176

Int. Cl.³ C07C *149/243;* C07D *339/00, 339/06, 339/08*

U.S. Cl. 549—11 **1 Claim**

1. A compound selected from:



wherein: R^1 and R^2 are independently selected from alkyl having 1–6 carbon atoms, phenylalkyl having 7–10 carbon atoms; or R^1 and R^2 may be jointed as indicated by the dotted line.

4,324,901

SOLUBLE POLYSILASTYRENE AND METHOD FOR PREPARATION

Robert C. West, and Lawrence D. David, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 29, 1981, Ser. No. 258,663
Int. Cl.³ C07F 7/08
U.S. Cl. 556—430 **11 Claims**

1. Process for making polysilastyrenes comprising reacting phenylmethyldichlorosilane and dimethyldichlorosilane in solvent solution in the presence of sodium in the ratio of 1 mole phenylmethyldichlorosilane to 0.25–2 moles dimethyldichlorosilane.

11. A polysilastyrene produced by the process of claim **1** having the general formula

$$[(Si{-}Me_2)_x\,(Si{-}Me{-}Ph)]_n$$

in which x equals 0.6–1.4 and n is a number up to 1200.

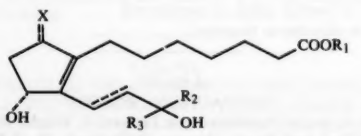
4,324,902

7-[5-OXO-3-HYDROXY-2-(3-SUBSTITUTED)-3-HYDROXYPROPYL)-1-CYCLOPENTENE]-HEPTANOIC ACIDS AND DERIVATIVES THEREOF

Masateru Miyano, Northbrook, and Clifford R. Dorn, Evanston, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 16, 1981, Ser. No. 254,828
Int. Cl.³ C07C 177/00
U.S. Cl. 560—53 **21 Claims**

1. A compound of the formula



wherein X is oxygen or hydroxyl, R_1 and R_3 are independently hydrogen or methyl and R_2 is $-(CH_2)n$-Y where n is an integer from 0 through 4 inclusive, and Y is phenyl, or a cycloalkyl group having 4 to 6 carbon atoms, and the pharmacologically acceptable salts thereof.

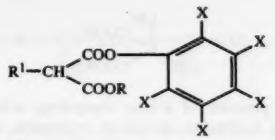
4,324,903

MALONIC ESTERS

Magda Huhn; Eva Somfai; Gabor Szabo; Gabor Resovszki, and Livia Gneth nee Zalantai, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Jun. 21, 1976, Ser. No. 698,063
Claims priority, application Hungary, Jun. 20, 1975, CI 1592
Int. Cl.² C07C 69/76, 79/46, 101/447
U.S. Cl. 560—82 **5 Claims**

1. A compound of the formula:



wherein

R is an alkyl or halosubstituted alkyl of 1 to 6 carbon atoms wherein the halo is fluoro, chloro, bromo or iodo, or

R is unsubstituted aromatic, or

R is a fused homocyclic ring system;

R^1 is aryl or aralkyl, unsubstituted or substituted by fluoro, chloro, bromo or iodo, nitro, dialkylamino, alkoxy or trifluoromethyl, the alkyl being C_1 to C_6; and

X is a halogen atom selected from the group consisting of fluorine, chlorine, bromine or iodine.

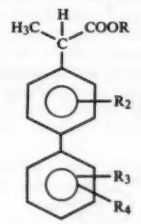
4,324,904

PROCESSES FOR THE PREPARATION OF HYDRATROPIC ACIDS AND ESTERS

Thomas A. Hylton, Kalamazoo Township, Kalamazoo County, and Jerry A. Walker, Oshtemo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 19, 1979, Ser. No. 105,166
Int. Cl.³ C07C 69/76
U.S. Cl. 560—102 **56 Claims**

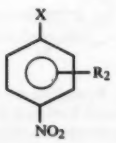
1. A process for the preparation of a compound selected from the group consisting of



I

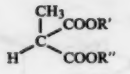
wherein R_2 is selected from the group consisting of hydrogen, halogen, alkoxy of from 1 to 6 carbon atoms, inclusive, alkyl of from 1 to 6 carbons, inclusive, cycloalkyl of from 4 to 7 carbons, inclusive, phenyl, and cyano; R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, hydroxyl, halogen, nitro, alkyl of from 1 to 6 carbons, inclusive, alkoxy of from 1 to 6 carbons, inclusive, phenyl, cyano, and cycloalkyl of from 4 to 7 carbons, inclusive, and R is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbons, inclusive, which comprises

(1) reacting a compound selected from the group consisting of

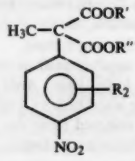


II

with a compound having the formula



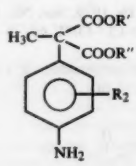
in the presence of a base comprising sodium hydride, sodium hydroxide, potassium hydroxide, or potassium carbonate to prepare a compound selected from the group consisting of



III

wherein X is halogen, R′ and R″ are the same or different and are alkyl of from 1 to 6 carbons, inclusive, or R′ and R″ taken together to form a cyclic diester comprising 2,2-dialkyl-1,3-dioxane-4,6-dione and R_2 is as defined above;

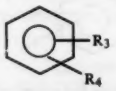
(2) reducing the nitro group of compound III from step 1 to produce a compound selected from the group consisting of



IV

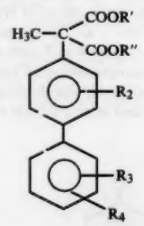
wherein R′, R″ and R_2 are all defined as above;

(3) coupling the compound IV of step 2 with a compound having the formula



V

to produce a compound selected from the group consisting of



VI

wherein R′, R″, R_2, R_3 and R_4 are defined as above; and

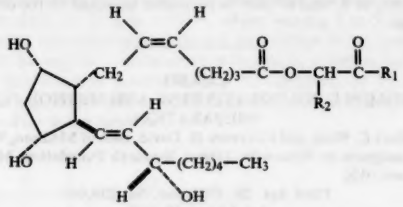
(4) treating the product VI of step 3 wherein treating the product VI is decarboxylation, decarboxylation and hydrolysis or hydrolysis and decarboxylation to obtain the compound selected from the group consisting of I above.

4,324,905
PHENACYL-TYPE ESTERS OF $PGF_{2\alpha}$ AND ITS 15-METHYL ANALOGS

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 14, 1974, Ser. No. 497,243
Int. Cl.³ C07C 177/00
U.S. Cl. 560—121 8 Claims

1. An optically active compound of the formula



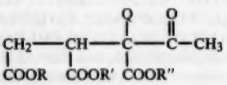
wherein R_1 is p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl; wherein R_2 is hydrogen or benzoyl and wherein R_1 is phenyl and R_2 is benzoyl.

4,324,906
CITRIC ACID ESTERS AND PROCESS FOR PRODUCING CITRIC ACID

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,043
Int. Cl.³ C07C 69/716, 59/265
U.S. Cl. 560—176 18 Claims

16. A compound of the formula



wherein

R is methyl, ethyl, or propyl;

R′ is methyl, ethyl, propyl, H, Na, K, Li, $Mg_{\frac{1}{2}}$, $Ca_{\frac{1}{2}}$, $Ba_{\frac{1}{2}}$, or $Sr_{\frac{1}{2}}$;

R″ is methyl, ethyl, or propyl; and

Q is chlorine or bromine.

4,324,907
EXTRACTION PROCESS

Peter J. Senior, Middlesbrough; Leonard F. Wright, Stockton-on-Tees, and Barry Alderson, Billingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1980, Ser. No. 125,483
Claims priority, application United Kingdom, May 8, 1979, 15858/79
Int. Cl.³ C07C 67/56, 69/675
U.S. Cl. 560—185 10 Claims

1. A process for the extraction of poly(β-hydroxy butyric acid) (PHB) from an aqueous suspension of PHB-containing bacterial cells comprising:

introducing an aqueous suspension of PHB-containing bacterial cells in finely divided form into a current of gas heated to a temperature of at least 100° C. to evaporate the water from the suspension,

collecting the resultant dried bacterial cells,

extracting the PHB therefrom by contact with an extraction solvent which is a liquid that is a solvent for the PHB in the bacterial cells, and

separating the extraction solvent from the PHB dissolved therein from the bacterial cell residue.

4,324,908

PREPARATION OF UNSATURATED ACIDS AND ESTERS FROM SATURATED CARBOXYLIC ACID DERIVATIVES AND CARBONYL COMPOUNDS OVER PHOSPHATE CATALYSTS

Robert K. Grasselli, Chagrin Falls, and Andrew T. Guttmann, Maple Heights, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 31, 1980, Ser. No. 221,583
Int. Cl.³ C07C *67/343*
U.S. Cl. 560—210 **23 Claims**

1. A process for producing unsaturated carboxylic acid and esters which comprises passing into a reaction zone, a vaporous mixture of a saturated monocarboxylic acid or its ester with formaldehyde or a formaldehyde derivative, at a temperature of from 200° C. to about 450° C., in the presence of a catalyst having the empirical formula

$$A_aPO_x$$

wherein

A is Fe, Ni, Co, Mn, Cu, Ag or mixtures thereof;

a is 0.2–3.0; and

x is determined by the nature and oxidation state of the other elements.

4,324,909

PROCESS FOR PREPARING GLYCOLS AND GLYCOL ESTERS

David Horvitz, and Thomas S. Brima, both of Cincinnati, Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,535
Int. Cl.³ C07C *67/05, 29/03*
U.S. Cl. 560—246 **6 Claims**

1. In the process for catalytically reacting olefin and oxygen in the liquid phase to provide saturated glycol or a mixture of saturated glycol and saturated glycol ester, the improvement which comprises employing as catalyst, a composition consisting essentially of at least one oxide of antimony or bismuth in admixture with at least one member of the group consisting of hydriodic acid; molecular iodine; hydriodic acid and molecular iodine; molecular iodine and hydrobromic acid; and, hydriodic acid and hydrobromic acid in a water or water-carboxylic acid reaction medium.

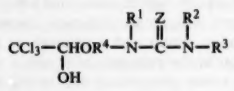
4,324,910

SUBSTITUTED UREA COMPOUND CONTAINING 2,2,2-TRICHLORO-1-HYDROXYETHYL GROUP

Stanley R. Sandler, Springfield, and Mabel M. Chen, Broomall, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 118,298, Feb. 4, 1980, abandoned. This application Feb. 20, 1981, Ser. No. 236,374
Int. Cl.³ C07C *127/15*; A62D *1/00*
U.S. Cl. 564—60 **6 Claims**

1. A compound having the formula:

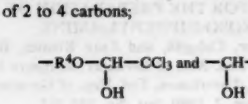


wherein:

(a) Z is selected from O or S;

(b) R^1 and R^2 are selected from the group consisting of H, alkyl of 1 to 6 carbons;

(c) R^3 is selected from H, alkyl of 1 to 6 carbons, hydroxyalkyl of 2 to 4 carbons;



and

(d) R^4 is an alkylene group of 2 to 6 carbon atoms.

4,324,911

PROCESS FOR THE CONTINUOUS PREPARATION OF DIACETYL ETHYLENE DIAMINE

Werner Wellbrock, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 7, 1980, Ser. No. 194,751
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941023
Int. Cl.³ C07C *102/04*
U.S. Cl. 564—141 **1 Claim**

1. A process for the continuous preparation of diacetyl ethylene diamine, which comprises allowing a mixture of ethylene diamine and acetic acid to react in a low-temperature zone at a temperature of about 80° to 140° C., completing the reaction of the mixture in a subsequent high-temperature zone of from about 160° to 215° C., discharging the diacetyl ethylene diamine obtained at the end of the high-temperature zone and stripping the reaction water in counter-current flow by an inert gas at a point located between the low-temperature and the high-temperature zone.

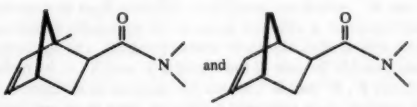
4,324,912

CARBOAMIDOALKYL NORBORNANES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

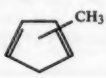
Philip T. Klemarczyk, Old Bridge; Frederick L. Schmitt, Holmdel; Edward J. Granda, Englishtown, and Domenick Luccarelli, Jr., Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 152,188, Jul. 17, 1980, abandoned. This application Nov. 13, 1980, Ser. No. 206,632
Int. Cl.³ C07C *103/19*
U.S. Cl. 564—188 **2 Claims**

1. A product containing a major proportion of isomers defined according to the structures:



produced according to the process of reacting methyl cyclopentadiene having the structure:



with N,N-dimethyl acrylamide in the presence of a catalyst defined according to the formula:

$$R'_nAlCl_m$$

wherein R' is C_1–C_3 alkyl and the sum, $m+n=3$ with m being 1 or 2 and n being 1 or 2 at a temperature in the range of from about 0° C. up to about 50° C.

4,324,913
PROCESS FOR THE PREPARATION OF 4-NITROSO-DIPHENYL-AMINE

Karlfried Wedemeyer, Cologne, and Lutz Kienitz, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,202
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935775
Int. Cl.³ C07C *85/145, 85/00*
U.S. Cl. 564—410 7 Claims

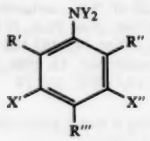
1. In the process of preparing 4-nitroso-diphenylamine by the steps of rearraning N-nitroso-diphenylamine according to Fischer-Hepp in an inert solvent which is immiscible with water under the effect of alcoholic hydrochloric acid and working up the suspension of thusly produced 4-nitroso-diphenylamine-hydrochloride by extraction with aqueous alkali, the improvement wherein o-dichlorobenzene is used as the water-immiscible solvent.

4,324,914
PROCESS FOR PREPARATION OF ANILINES SUBSTITUTED BY CHLORINE IN THE META-POSITION

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jan. 23, 1980, Ser. No. 114,651
Claims priority, application France, Feb. 15, 1979, 79 04483
Int. Cl.³ C07C *85/11, 85/24*
U.S. Cl. 564—412 20 Claims

1. A process for the preparation of anilines substituted in the meta-position by chlorine, by the catalytic hydrogenation of chlorine-substituted nitrogen-containing benzene derivatives, in the liquid phase, in an acid medium, under the action of heat, under pressure and in the presence of noble metals from group VIII of the periodic classification, in which process the benzene derivatives have the formula:



(I)

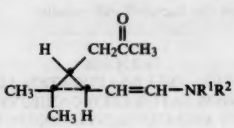
in which Y represents the hydrogen atom or the oxygen atom, X′ and X″, which are identical or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical, it being furthermore possible for one of the symbols X′ and X″ to be hydrogen, and R′, R″ and R‴, which are identical or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aralkyl, alkoxy or aryloxy radical, at least one of these three symbols representing the chlorine atom and it being furthermore possible for at most two of the symbols R′, R″ and R‴ to be hydrogen, and the reaction is carried out in the presence of chloride ions in an amount which is such that the ratio of the concentrations $[Cl^-]/[H^+]$ is greater than 1.5.

4,324,915
KETOENAMINE PYRETHROID INTERMEDIATES

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 1, 1981, Ser. No. 259,725
Int. Cl.³ C07C *45/00, 83/00, 87/24*
U.S. Cl. 564—454 7 Claims

1. A compound of the formula



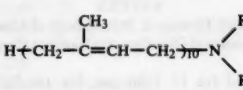
wherein R^1 and R^2 each independently is an alkyl group containing from 1 to 4 carbon atoms.

4,324,916
DECAPRENYLAMINE DERIVATIVES

Yoshiyuki Tahara, Ohi; Hiroyasu Koyama, Ageo; Yasuhiro Komatsu, Niiza; Reiko Kubota, Tokyo, and Toshihiro Takahashi, Ohi, all of Japan, assignors to Nisshin Flour Milling Co. Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,325
The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.
Int. Cl.³ C07C *87/452, 91/06, 91/08, 91/12*
U.S. Cl. 564—462 8 Claims

1. A compound of the general formula



wherein R_1 represents a hydrogen atom, decaprenyl group, a lower alkyl group or a hydroxy-lower alkyl group, and R_2 represents a lower alkyl or alkenyl group optionally substituted with at least one hydroxy, amino or alkylamino group, or a cycloalkyl group, and acid addition salts thereof.

4,324,917
PREPARATION OF POLYALKYLENE POLYAMINES

Thomas T. McConnell, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 28, 1980, Ser. No. 182,206
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 8 Claims

1. An improved process for selectively preparing a predominantly noncyclic polyalkylene polyamine compound comprising the steps of:

contacting an alkyleneamine compound having two primary amino groups with an alkanolamine compound having a primary amino group and a primary or secondary hydroxy group in the presence of a cation exchange resin containing active phosphorus sites acting as a catalyst at temperatures of from about 250° C. to about 400° C. under a pressure sufficient to maintain the mixture essentially in liquid phase; and

recovering said polyalkylene polyamine compound from the resultant reaction mixture.

4,324,918

N,N-DIMETHYL-N'-ISOBUTYL-N'-β-HYDROXYETHYL-PROPYLENEDIAMINE AND A PROCESS FOR ITS PREPARATION

Jürgen Weber, Oberhausen; Volker Falk, Voerde, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,697

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940256

Int. Cl.³ C07C *91/08, 91/12*

U.S. Cl. 564—503 1 Claim

1. N,N-dimethyl-N'-isobutyl-N'-β-hydroxyethyl-propylenediamine.

4,324,919

PRODUCTION OF TERTIARY PHOSPHINES

Georg Elsner, Hürth; Hartfrid Vollmer, Erftstadt, and Ernst Reutel, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,057

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936210

Int. Cl.³ C07F *9/50*

U.S. Cl. 568—8 1 Claim

1. In the process for making tertiary phosphines of the general formula R_3P, in which R stands for a linear alkyl radical having 2 to 4 carbon atoms, by reacting hydrogen phosphide with linear monoolefins having 2 to 4 carbon atoms under pressures of 5 to 25 bars and temperatures of 50° to 200° C. in the presence of an agent yielding free radicals, the improvement which comprises: preparing a solution of the tertiary phosphine which is desired to be made, in an inert solvent, and performing the reaction of the PH_3 with the monoolefin in said solution, which is used in such amounts that the tertiary phosphine in the solution is applied in a proportion of 50 to 500 mol%, based on PH_3.

4,324,920

PROCESS FOR THE PREPARATION OF ORTHO-(HYDROCARBYLTHIO)-PHENOLS

Bonnie G. McKinnie, and Paul F. Ranken, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 28, 1980, Ser. No. 172,977

Int. Cl.³ C07C *148/00*

U.S. Cl. 568—54 12 Claims

1. A process for the preparation of ortho-substituted phenols which comprises reacting a phenol having at least one hydrogen on a carbon atom ortho to a hydroxy group with a hydrocarbyl disulfide in the presence of an aluminum phenoxide catalyst so that an ortho-(hydrocarbylthio)-phenol is prepared, the molar ratio of said catalyst relative to said disulfide being between about 0.01 and 0.5.

4,324,921

PROCESS FOR THE MANUFACTURE OF ETHERS OF HYDROXY-PIVALALDEHYDE

Hans-Jürgen Arpe, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

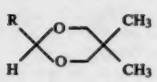
Filed May 29, 1980, Ser. No. 154,319

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922698

Int. Cl.³ C07C *45/60, 47/19*

U.S. Cl. 568—427 3 Claims

1. A process for the preparation of an ether of hydroxypivalaldehyde of the formula $RCH_2OCH_2—C(CH_3)_2CHO$ wherein R is hydrogen, linear or branched alkyl having from 1 to 7 carbon atoms, cyclohexyl or phenyl which comprises isomerizing a 5,5-dimethyl-1,3-dioxane compound having the structure:



at a temperature in the range of 250° C. to 500° C. in the presence of a catalyst containing silicon dioxide, 4 to 40 mmols per 100 grams SiO_2 of an oxide or hydroxide of didymium and 10 to 100 mmols per 100 grams of SiO_2 of an oxide or hydroxide of sodium or potassium, or both, said catalyst being formed by calcination at a temperature of from 600° C. to 1000° C. for 30 minutes to 8 hours.

4,324,922

REIMER-TIEMANN ALDEHYDE SYNTHESIS PROCESS

William E. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 53,130, Jun. 28, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,727

Int. Cl.³ C07C *45/00*

U.S. Cl. 568—437 6 Claims

1. A process for preparing aromatic hydroxyaldehydes comprising reacting by contacting a phenolic compound, chloroform and aqueous alkali metal hydroxide at a temperature from about 70° C. to about 105° C. and at an elevated pressure less than about 100 atmospheres for a time sufficient to form substantial amounts of aromatic hydroxyaldehyde and subsequently recovering the aromatic hydroxyaldehyde formed.

4,324,923

CYCLOHEXYL PHENETHYLETHER DERIVATIVE

Jacob Kiwala, Brooklyn, N.Y.; Richard J. Tokarzewski, Keyport, N.J.; Frederick L. Schmitt, Holmdel, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

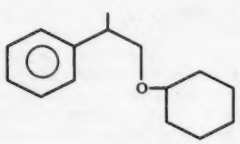
Continuation-in-part of Ser. No. 192,238, Sep. 30, 1980. This application Feb. 19, 1981, Ser. No. 235,844

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ C07C *43/184*

U.S. Cl. 568—659 1 Claim

1. The cyclohexyl phenethylether derivative wherein the structure of the cyclohexyl phenethylether is:



4,324,924

PROCESS FOR REMOVING ISOBUTENE FROM A C_4 CUT AND PRODUCING METHYL TERT-BUTYL ETHER

Bernard Torck, Boulogne sur Seine; Alain Convers; Didier Duee, both of Rueil Malmaison, and Paul Mikitenko, Noisy Le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 24, 1980, Ser. No. 143,242

Claims priority, application France, Apr. 24, 1979, 79 10399

Int. Cl.³ C07C *41/06, 7/00*

U.S. Cl. 568—697 11 Claims

1. A process for producing methyl tert-butyl ether and recovering a substantially isobutene- and methanol-free C_4 cut by reacting methanol with a hydrocarbon C_4 cut comprising from 10 to 60% by weight of isobutene, said process comprising the steps of:

(a) contacting a mixture of methanol, said C_4 cut, and a recycle stream as hereinafter defined, in a first reaction zone, with an acid catalyst, under conditions for etherification of isobutene with methanol, and converting from 93 to 98% of isobutene, the methanol/isobutene molar ratio being maintained higher than 1:1 at the inlet and at the outlet of said first reaction zone;

(b) fractionating the effluent from step (a) under a pressure of at least 10 bars, and separately recovering an overhead fraction having a methanol/isobutene molar ratio higher than 1:1 and a bottoms product fraction comprising methyl tert-butyl ether, and discharging said bottoms product fraction;

(c) contacting the overhead fraction from step (b) with an acid catalyst, in a second reaction zone, under conditions for etherification of isobutene with methanol such that an overall isobutene conversion of at least 99% is effected;

(d) fractionating the effluent from step (c) under a pressure of 1–9 bars, and separately recovering an overhead fraction consisting essentially of C_4 hydrocarbons and a minor proportion of methanol, and a bottoms fraction containing methanol, methyl tert-butyl ether and a minor proportion of C_4 hydrocarbons, and having a methanol/methyl tert-butyl ether molar ratio higher than 1:1, said bottoms fraction being recycled as said recycle stream to step (a); and

(e) washing at least a portion of the overhead fraction from step (d) with water, and separately recovering a substantially isobutene- and methanol-free C_4 cut, and a methanol-containing aqueous wash stream.

4,324,925

PROCESS FOR THE PREPARATION OF POLYHYDRIC PHENOLS

Christoph Jupe, Cologne; Helmut Waldmann, Leverkusen, and Hermann Seifert, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,444

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928743

Int. Cl.³ C07C *39/12, 79/24, 91/30, 149/36*

U.S. Cl. 568—719 **15 Claims**

1. A process for the preparation of a polyhydric phenol which comprises contacting a phenol containing one or more hydroxyl groups bonded to one or more aromatic nuclei which phenols can contain one or more other substituents in addition to the one or more hydroxyl groups on the aromatic ring which additional substituents are selected from the group consisting of C_1 to C_{10} alkyl, C_3 to C_{12} cycloalkyl, phenol, naphthyl, fluorine, chlorine, bromine, nitro, cyano, sulfonic acid, carboxyl, carbo-C_1–C_{10} alkoxy, C_1–C_3 alkoxy, or C_1–C_4 dialkylamino, it being possible for the alkyl and cycloalkyl radicals to be substituted by fluorine, chlorine, or bromine atoms, or C_1–C_5 alkoxy, C_1–C_4 dialkylamino, carboxyl, nitro, cyano, sulfonic acid or C_1–C_{10} carbalkoxy groups and for the phenol and naphthyl radicals to be substituted by fluorine, chlorine, bromine, C_1–C_{10} alkyl, C_3–C_{12} cycloalkyl or nitro, carboxyl, carbo-C_1–C_{10} alkoxy, C_1–C_5 alkoxy, cyano, sulfonic acid or C_1–C_4 dialkylamino groups with a cation exchanger containing SO_3— and/or COO— groups at a temperature of 0° to 200° C. employing 0.1 to 1000 parts by weight of phenol per hour, separating said phenol from said cation exchanger and thereafter hydroxylating said phenol by contacting the same with a peroxidic hydroxylating agent which contains 1 or more —O—O— groups.

4,324,926

PROCESS FOR THE PURIFICATION OF 4,4' DIHYDROXYDIPHENYL

Walter R. Demler, Hamburg; Krishen L. Nagpal, Williamsville; Richard M. Dollard, West Seneca; Eugene Odin, Williamsville, and Donald T. Donahue, Kenmore, all of N.Y., assignors to Buffalo Color Corporation, West Paterson, N.J.

Filed Mar. 6, 1980, Ser. No. 127,774

Int. Cl.³ C07C *37/82, 39/21*

U.S. Cl. 568—730 **31 Claims**

1. A process for purifying 4,4'-dihydroxydiphenyl comprising contacting a solution of 4,4'-dihydroxydiphenyl containing 4-monohydroxydiphenyl alkali metal salt with activated carbon followed by removing the activated carbon from the solution and acidifying the solution with sufficient acid to convert essentially all of the 4,4'-dihydroxydiphenyl alkali metal salt to water insoluble 4,4'-dihydroxydiphenyl.

4,324,927

PROCESS FOR THE HOMOLOGIZATION OF METHANOL

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 3, 1980, Ser. No. 155,932

Claims priority, application France, Jun. 7, 1979, 79 15079

Int. Cl.³ C07C *29/32, 29/36*

U.S. Cl. 568—902 **18 Claims**

1. A process of hydrocarbonylating methanol to produce ethanol, which comprises reacting methanol with a mixture of carbon monoxide and hydrogen, at a temperature of at least about 180° C., under a total pressure of between about 50 and 400 bars, in the presence of cobalt and ruthenium, of at least one ionic halide, the cation of which is chosen from the group consisting of alkali-metal cations, alkaline earth metal cations, quaternary ammonium cations, and quaternary phosphonium cations, and of at least one alkyl halide, the molar ratio X^-/Co, X^- being the halide ion originating from the ionic halide, being at least about 5, the molar ratio X/Co, X being the halogen originating from the alkyl halide, being at least about 2, and the gram atom ratio of ruthenium to cobalt being at least about 2.

4,324,928

STABILIZED METHYLCHLOROFORM FORMULATION CONTAINING CYCLOPROPYL METHYL CARBINOL

Alvetta Pryor, Houston, and Nobuyuki Ishibe, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 3, 1980, Ser. No. 212,649

Int. Cl.³ C07C *17/42*

U.S. Cl. 570—118 **3 Claims**

1. In a stabilizer formulation useful in stabilizing methylchloroform used in vapor degreasing wherein said formulation contains an alkylene oxide as a component of said stabilizer, the improvement which comprises employing cyclopropyl methyl carbinol in place of the epoxide in said formulation.

4,324,929

PROCESS FOR PRODUCING MONO, BIS OR TRIS(3,3,3-TRIFLUOROPROPYL)BENZENE

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

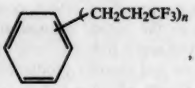
Filed Feb. 12, 1981, Ser. No. 234,062

Claims priority, application Japan, Feb. 22, 1980, 55-21094

Int. Cl.³ C07C *17/28, 25/14*

U.S. Cl. 570—127 **5 Claims**

1. A process for producing a 3,3,3-trifluoropropylated benzene derivative represented by the following formula



wherein n is an integer of 1, 2 or 3, which comprises bringing benzene into reaction with 3,3,3-trifluoropropylene in the presence of an acid catalyst selected from the group consisting of hydrogen fluoride, boron trifluoride and a mixture thereof.

5. Bis(3,3,3-trifluoropropyl)benzene.

4,324,930

2,3-DICHLORO-2-TRIFLUOROMETHYL-1,1,1,3,4,4,5,5,5-NONAFLUOROPENTANE AND PROCESS FOR ITS MANUFACTURE

Sigmar-Peter von Halasz, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,787

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012005

Int. Cl.³ B01J *19/08;* C07C *19/08*

U.S. Cl. 570—134 1 Claim

1. A 1-halo-4-decene represented by the general formula

$$CH_3-(-CH_2-)_4CH=CH-(-CH_2-)_3X,$$

in which X is a halogen atom.

4,324,931

1-HALO-4-DECENE COMPOUNDS

Toshinobu Ishihara; Kenichi Taguchi; Akira Yamamoto; Nobuo Takasaka; Hisashi Shimizu, and Mitsuyoshi Oshima, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,991

Claims priority, application Japan, Nov. 19, 1979, 54-149767

Int. Cl.³ C07C *21/04*

U.S. Cl. 570—189 2 Claims

2. The 1-halo-4-decene as claimed in claim 1 wherein the halogen is chlorine or bromine.

4,324,932

PROCESS FOR THE MANUFACTURE OF VINYL CHLORIDE BY THE THERMAL CRACKING OF 1,2-DICHLOROETHANE

Gerhard Link, Jakob-Steffanstr. 14, 65 00 Mainz; Josef Riedl, Kantstr. 53, 8261 Burgkirchen; Walter Fröhlich, Kampenwandstr. 11, 8261 Burgkirchen, and Reinhard Krumböck, Lohnerstr. 40, 8261 Burgkirchen, all of Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,789

Int. Cl.³ C07C *21/06*

U.S. Cl. 570—226 10 Claims

1. A process for the manufacture of vinyl chloride in a reaction furnace by thermal cracking of 1,2-dichloroethane, wherein reaction gas leaving the reaction furnace is cooled in two stages, in one of which stages the gas is cooled indirectly by a liquid or gaseous coolant for subsequent splitting by distillation, said process incorporating the improvement which comprises cooling the reaction gas mixture to a temperature within the range of 220° to 120° C. in the indirect stage at an average cooling rate, in degrees C. per second, of at least 1/10 of the temperature in degrees C. of the gas mixture entering the indirect stage, and the reaction gas mixture together with any condensate resulting from this mixture being further cooled directly or indirectly in at least one downstream stage.

4,324,933

ELECTRICAL INSULATING OIL COMPOSITIONS

Shoji Kimura, Chigasaki; Noboru Ishida, Sagamihara; Midori Masunaga, Tokyo, and Yoshiki Kohno, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 863,189, Dec. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 791,280, Apr. 27, 1977, abandoned. This application Jun. 24, 1980, Ser. No. 162,565

Claims priority, application Japan, May 1, 1976, 51-49405

Int. Cl.³ H01B *3/22;* C10G *39/00*

U.S. Cl. 585—6.6 14 Claims

1. An electrical insulating oil composition consisting essentially of (I) 50–85 parts by weight of a mixed or paraffinic base crude oil-derived electrical insulating oil having a sulphur content of not higher than 0.35 wt.% and being obtained by the steps of:

refining with a solvent a distillate boiling within the range of 230° to 430° C. at atmospheric pressure, the distillate being obtained by distillation of a mixed or paraffinic base crude oil at atmospheric pressure or by distillation at a reduced pressure of a residual oil produced by distillation of the crude oil at atmospheric pressure, to obtain a raffinate,

hydrofining the thus obtained raffinate and solvent dewaxing the thus hydrofined raffinate,

(II) 50–15 parts by weight of a naphthenic base crude oil-derived insulating oil, and (III) of 0.001–1.0% by weight of a hydrocarbon derived pour point depressant, based on the total weight of the oils (I) and (II), selected from the group consisting of (1) copolymers of ethylene and α-olefin having the general formula $CH_2=CH-R$ wherein R is an alkyl group having at least one carbon atom, (2) polymers of α-olefin having the general formula $CH_2=CH-R$ wherein R is any one of C_{7-18} alkyl groups which are identical with, or different from, each other, the polymers containing $-CH_2-_n$ wherein n is at least 6, (3) styrene-butadiene copolymers in hydrogenated form, and (4) alkylated polystyrenes obtained by the reaction of a polystyrene having a number average molecular weight of 10,000–150,000 with an alkyl halide of the formula RX wherein R is an alkyl group having 6–20 carbon atoms and X is a halogen atom.

4,324,934

HYDROCARBON, A PROCESS FOR ITS PRODUCTION AND ITS USE AS A REACTIVE THINNER FOR AIR-DRYING LACQUERS

Erich Eimers, and Rolf Dhein, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,567

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001739

Int. Cl.³ C09D *7/06;* C07C *2/52, 13/605;* C08K *5/01*

U.S. Cl. 585—21 8 Claims

1. 1:1-codimers of dicyclopentadiene and 1,3-butadiene having a molecular weight of 186.

2. A process for producing the 1:1-codimers claimed in claim 1 wherein gaseous 1,3-butadiene is reacted with dicyclopentadiene in the presence of an organo-cobalt complex compound at a temperature of 40°–100° C. while introducing the major portion of the 1,3-butadiene into the reaction at a rate which does not exceed its reaction velocity.

4,324,935

SPECIAL CONDITIONS FOR THE HYDROGENATION OF HEAVY HYDROCARBONS

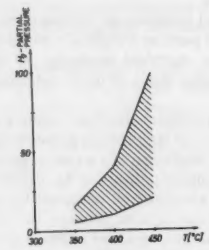
Hans J. Wernicke, Wolfratshausen, and Claus Schliebener, Strasslach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,719

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941851

Int. Cl.³ C10G 47/00, 67/00

U.S. Cl. 585—314 11 Claims



1. In a process for the cracking of heavy liquid hydrocarbons comprising monoaromatics and polyaromatics, said process comprising a catalytic hydrogenating pretreatment of said heavy hydrocarbons, separating hydrogenation product into a lighter fraction containing the major portion of the monoaromatics and a heavier fraction; passing the heavier fraction at least in part to a thermal cracking step to produce normally gaseous olefins; and withdrawing the lighter fraction, the improvement wherein hydrogenation is conducted within the shaded area of FIG. 2, wherein at temperatures of between 350° and 450° C., the hydrogen partial pressure and the hydrogenation temperature are selected so that their values in a hydrogen partial pressure-temperature diagram lie within the area bounded by the curve having the corner coordinates 350° C./5 bar; 350° C./15 bar; 400° C./40 bar; 450° C./100 bar; 450° C./20 bar; and 400° C./10 bar, whereby said lighter fraction has a higher octane number.

4,324,936

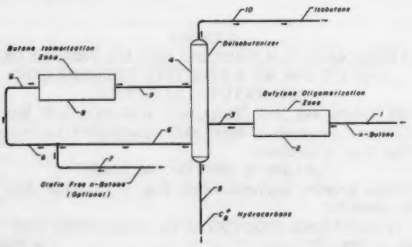
BUTANE ISOMERIZATION PROCESS

Michael Z. Mikulicz, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1980, Ser. No. 220,498

Int. Cl.³ C07C 2/58

U.S. Cl. 585—315 6 Claims



1. In a process for the isomerization of normal butanes wherein a recycle stream which is rich in normal butane is withdrawn from a deisobutanizer column and is then passed into a butane isomerization zone, a butane isomerization zone effluent stream which comprises isobutane and normal butane is passed into the deisobutanizer column, and a product stream which is rich in isobutane is withdrawn from the deisobutanizer column; the improvement which comprises passing a fresh feed stream to the butane isomerization zone, which comprises isobutylene and is rich in normal butane, through an oligomerization zone and thereby producing an oligomerization zone effluent stream which is rich in normal butane and comprises C_8 hydrocarbons, passing the oligomerization zone effluent stream into the deisobutanizer column, and removing a net bottoms stream comprising C_8 hydrocarbons from the deisobutanizer column.

4,324,937

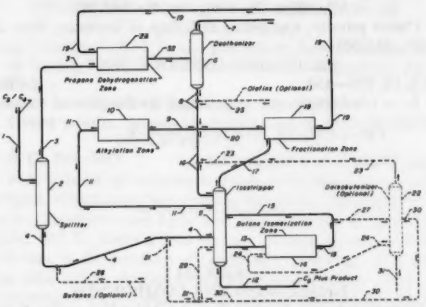
CONVERSION OF PROPANE AND BUTANE INTO GASOLINE

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 112,484, Jan. 16, 1980, Pat. No. 4,275,255. This application Dec. 29, 1980, Ser. No. 220,546

Int. Cl.³ C07C 2/58

U.S. Cl. 585—315 15 Claims



1. A hydrocarbon conversion process which comprises the steps of:

(a) passing a first feed stream which is rich in propane and a recycle stream which also is rich in propane into a dehydrogenation zone operated at dehydrogenation conditions and producing a dehydrogenation zone effluent stream which comprises propane and propylene;

(b) passing a second feed stream, which is rich in butanes into a first fractionation zone;

(c) withdrawing a first process stream, which is rich in normal butane, from the first fractionation zone and passing said first process stream into a butane isomerization zone operated at isomerization conditions and producing an isomerization zone effluent stream which comprises isobutane and normal butane;

(d) passing the isomerization zone effluent stream into the first fractionation zone;

(e) transferring a net overhead stream which comprises propane and isobutane from the first fractionation zone to a second fractionation zone wherein the net overhead stream is separated into the previously referred to propane-rich recycle stream and a second process stream, which is rich in isobutane;

(f) passing the dehydrogenation zone effluent stream, the second process stream and a third process stream, which is rich in isobutane and is withdrawn from the first fractionation zone, into an alkylation zone operated at alkylation conditions and thereby producing an alkylation zone effluent stream which comprises normal butane, propane and C_7–C_8 aliphatic hydrocarbons;

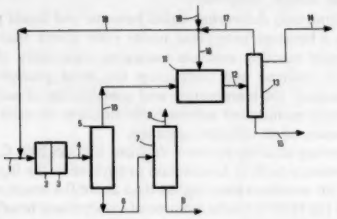
(g) passing the alkylation zone effluent stream into the first fractionation zone; and,

(h) withdrawing a product stream comprising C_5-plus aliphatic hydrocarbons from the first fractionation zone.

4,324,938
PROCESS FOR UPGRADING C_4 OLEFINIC CUTS

Jean Cosyns, Maule; Bernard Juguin; Jean-Francois Le Page, both of Rueil-Malmaison, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 21, 1980, Ser. No. 180,203
Claims priority, application France, Aug. 21, 1979, 79 21208
Int. Cl.³ C07C *1/00*
U.S. Cl. 585—332 **13 Claims**



1. A process for upgrading an olefinic C_4 hydrocarbon cracking or steam cracking cut, comprising the steps of:

(a) feeding the olefinic cut to a hydro-isomerization zone where the cut is treated in the presence of hydrogen and an isomerization catalyst containing at least one group VIII metal, deposited on a carrier, under such conditions that at least 80% of the 1-butene in said cut is isomerized to 2-butenes, the percentages of the other components of the cut being essentially unchanged, and such that, at the end of the isomerization reaction, the normal butenes contained in the hydro-isomerization effluent comprise at least 85% by weight of 2-butenes and less than 15% by weight of 1-butene;

(b) feeding the entire effluent from the hydro-isomerization zone, without any intermediary fractionation, to a catalytic polymerization zone containing a catalyst different from the hydro-isomerization catalyst, the polymerization catalyst being a fluorinated alumina, a boron alumina, or a silica-alumina, and converting at least 90% of the isobutene contained in the hydroisomerization effluent mainly to isobutene dimers and trimers, the aggregate conversion of the normal butenes contained in the cut being kept lower than or at most equal to 10% by weight, the butene and isobutane contained in the effluent of the hydro-isomerization zone being substantially unconverted;

(c) fractionating the effluent from the polymerization zone in a fractionation zone and recovering therefrom a first fraction comprising in major part isobutene dimers and trimers, and a second fraction comprising in major part isobutane, butane and butenes; and feeding said second fraction to an alkylation zone, fractionating the alkylation effluent in a fractionation zone, and recovering therefrom (i) an alkylate, (ii) LPG having a high content of saturated C_4 hydrocarbons, and (iii) a fraction comprising mainly isobutane.

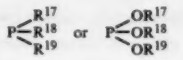
4,324,939
PROCESS FOR PREPARING REACTION PRODUCTS OF CONJUGATED DIOLEFINS AND AROMATIC HYDROCARBONS

Karl Hahn, Marl, and Wolfgang Kampf, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,618
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1980, 3000708
Int. Cl.³ C07C *3/00*
U.S. Cl. 585—438 **12 Claims**

1. A process for preparing a reaction product of a conjugated diolefin and an aromatic hydrocarbon comprising contacting these reactants with a catalyst comprising

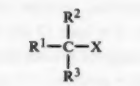
(1) a phosphorous modified cobalt compound comprising a cobalt compound which is soluble in the aromatic hydrocarbon, and a phosphorus compound of the formula



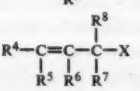
wherein R^{17}, R^{18} and R^{19} each, independently, is C_{1-14}-alkyl, C_{2-14}-alkenyl or C_{6-14}-aryl;

(2) a halogen-containing organoaluminum compound; and

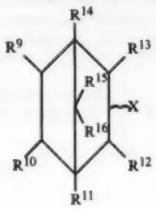
(3) a modifier of the formula



I



II



III

wherein

X is chlorine, bromine, or iodine, and

R^1 through R^{16}, independently are

straight-chain or branched, saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon radicals of 1–20 carbon atoms, optionally substituted by 1–41 halogen atoms, or

hydrocarbon aryl radicals of 6–14 carbon atoms optionally substituted by (a) 1–5 straight-chain or branched, saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon radicals each of 1–10 carbon atoms, each optionally halogen-substituted, or (b) 1–9 halogen atoms

and wherein R^4 through R^{16} can also be hydrogen, and R^2 and R^3 can also be hydrogen only when R^1 is optionally substituted hydrocarbon aryl as defined above.

4,324,940
SHAPE SELECTIVE ACID CATALYZED REACTIONS OF OLEFINS OVER CRYSTALLINE ZEOLITES

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 9, 1980, Ser. No. 138,638
Int. Cl.³ C07C *5/23*
U.S. Cl. 585—466 **17 Claims**

1. In a process for effecting reaction involving olefins in a stream containing olefins of various sizes which comprises contacting said stream at a temperature of from about 450° F. to about 1000° F., a pressure of from about 0 psig to about 500 psig, a weight hourly space velocity of from about 0.1 hr^{-1} to about 200 hr^{-1} and a hydrogen/olefin mole ratio of from about 0.1 to about 100 with a catalyst comprising one or more members of a class of crystalline zeolites characterized by a silica/alumina mole ratio of at least 12 and a Constraint Index within the approximate range of greater than about 2 to about 12, the improvement which comprises (1) said stream contain-

ing smaller olefins of an effective critical dimension of 6.8 Angstroms or less and larger olefins of an effective critical dimension of greater than 6.8 Angstroms and (2) said catalyst being acidic, whereby said reaction is preferentially selective toward said smaller olefins.

2. In a process for effecting reaction involving olefins in a stream containing olefins of various shapes which comprises contacting said stream at a temperature of from about 450° F. to about 1000° F., a pressure of from about 0 psig to about 500 psig, a weight hourly space velocity of from about 0.1 hr^{-1} to about 200 hr^{-1} and a hydrogen/olefin mole ratio of from about 0.1 to about 100 with a catalyst comprising one or more members of a class of crystalline zeolites characterized by a silica/alumina mole ratio of at least 12 and a Constraint Index within the approximate range of greater than about 2 to about 12, the improvement which comprises (1) said stream containing both linear and branched olefins having effective critical dimensions of 6.8 Angstroms or less and (2) said catalyst being acidic, whereby said reaction is preferentially selective toward said linear olefins.

4,324,941

PROCESS FOR THE PRODUCTION OF CUMENE

Marcello Ghirga, Bresso; Luigi Valtorta, Desio, and Benedetto Calcagno, Milan, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Jan. 15, 1981, Ser. No. 225,220

Int. Cl.³ C07C 2/68

U.S. Cl. 585—466 **10 Claims**

1. A process for producing cumene by alkylation of benzene with propylene in the presence of a solid phosphoric acid catalyst, which comprises:

continuously delivering liquid benzene and liquid propylene in a benzene/propylene molar ratio lower than 6:1, to a liquid reaction medium consisting essentially of benzene and cumene and containing the solid phosphoric acid catalyst, the temperature and composition of said medium being maintained substantially uniform in each point by means of an efficient agitation;

operating at a temperature of from 170° to 280° C., under a pressure such as to maintain propylene in the liquid phase, with a contact time higher than about 0.4 hours, expressed as the ratio between volume of catalyst and hourly volume of benzene and propylene fed in, and with a propylene conversion of at least about 60%; and

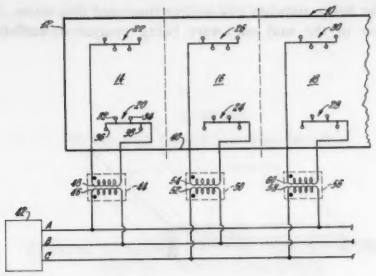
discharging continuously a stream of liquid reaction medium and recovering cumene present in said stream.

4,324,942

ELECTRIC GLASS MELTING FURNACE

Michael Williamson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 22, 1980, Ser. No. 218,882
Int. Cl.³ C03B 5/02
U.S. Cl. 373—39 10 Claims



8. An electric furnace for heating glass by the Joule effect, said furnace comprising: a chamber adapted for holding a body of molten glass; a plurality of electrodes positioned in said chamber such that said electrodes form three zones with two clusters of said electrodes in each of said zones, said clusters in said zones being located on opposite sides of said chamber, each of said clusters comprising a first set of two electrodes being located in a first row and positioned a first predetermined distance from the other cluster in the respective zone and a second predetermined distance from each other and a second set of two electrodes being located in a second row and positioned a third predetermined distance from said other cluster in said respective zone and a fourth predetermined distance from each other, said third predetermined distance being greater than said first predetermined distance and said fourth predetermined distance being greater than said second predetermined distance, said first and second sets being positioned such that said second set of electrodes carries at least 60% of the current carried by said first set of electrodes and said first and second rows being parallel to each other; and first, second and third sources of power, each of said power sources being connected to the clusters of a separate zone and being phase related and connected to produce a phase angle relationship between adjacent zones.

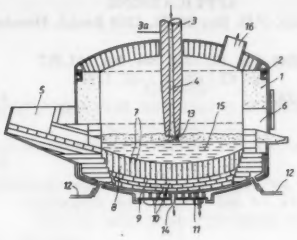
4,324,943

DC ARC FURNACE HEARTH CONSTRUCTION

Sven-Einar Stenkvist, and Bo Rappinger, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 23, 1980, Ser. No. 162,392
Claims priority, application Switzerland, Jun. 26, 1979, 7905584
Int. Cl.³ H05B 7/00
U.S. Cl. 373—72 7 Claims

1. A DC arc furnace comprising an electrically conductive hearth adapted to containing a melt, at least one arcing electrode positioned above the hearth and adapted to form an arc with the melt, and means for connecting said hearth and electrode with DC power; wherein the improvement comprises said conductive hearth being formed by bricks layed so as to build a wall adapted to contain the melt and to be directly contacted by the melt, an electrically conductive layer on which the bricks are layed and is adapted to be connected with a DC power circuit including the arcing electrode, and electric conductors installed in said wall so as to extend from said layer



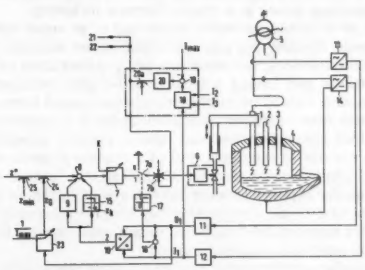
upwardly to the wall's top surface so as to be contacted by the melt.

4,324,944

ARRANGEMENT FOR CONTROLLING THE ELECTRODES OF AN ARC FURNACE

Georg Weihrich, Uttenreuth; Wilfried Grunert, and Hans-Jörg Nüsslin, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,216
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948787
Int. Cl.³ H05B 7/148
U.S. Cl. 373—105 6 Claims



1. In an arrangement for controlling arc furnace electrode means comprising at least one melting electrode fed from an output winding of a transformer, and including an impedance controller for each electrode, associated positioning means to adjust the height of each electrode, measuring means to furnish a first measured quantity proportional to the electrode voltage between the output winding of the transformer and the furnace jacket and a second measured quantity proportional to the electrode current, the invention comprising:

a divider connected to the measuring means to produce an actual impedance value proportional to the ratio of the first measured quantity to the second measured quality;

means to form a control deviation as the difference between a preset desired impedance value and the actual impedance value;

a lowpass filter connected to the output of the divider;

a first switching element connected in parallel to the filter, the output of the filter being connected to drive the impedance controller to the full in the event of a short circuit; and

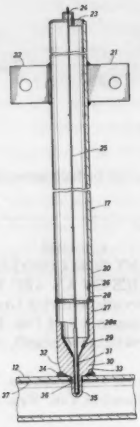
a second switching element connected to the output of the impedance controller to cut off signals therefrom at the instant the sum of the first and second measured quantities becomes zero.

4,324,945

THERMOWELL APPARATUS FOR PETROCHEMICAL APPLICATIONS

Robert B. Sivyer, P.O. Box 40471, 1314 Beutel, Houston, Tex. 77055

Filed Apr. 18, 1980, Ser. No. 141,397
Int. Cl.³ G01K *1/08, 1/14*
U.S. Cl. 136—242 **4 Claims**



1. A thermowell apparatus for use in sensing temperature and supporting piping in a cracker furnace including,

a one piece tubular assembly comprised of an upper tubular support member and a lower tubular sensor member with hollow interiors, said members being constructed of like materials and having a welded end-to-end interconnection, said welded interconnection being spaced from a tip of said sensor member a sufficient distance to dispose said welded connection and said tubular support member on the exterior of the outer wall of a cracker furnace when said tubular sensor member is attached to a furnace pipe,

said tubular support member having a wall thickness sufficient to provide a supporting function for a furnace pipe under temperature conditions which exist exterior to the outer wall of a cracker furnace,

said tubular sensor member having a wall thickness sufficient to provide a weight supporting function for a furnace pipe within a cracker furnace at temperature conditions up to 2000 degrees F.

the tip of said tubular sensor member having an elongated, hollow tip portion for insertion into an opening in the upper surface of a furnace pipe for temperature measuring purposes and having a radially enlarged solid metal portion adjacent said tip portion, said metal portion having a 30 degree welding bevel for permitting a welding attachment of said enlarged metal portion to a furnace pipe, said hollow tip portion having an opening sized to receive a thermocouple member.

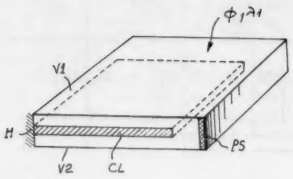
4,324,946

SOLAR RADIATION CONCENTRATOR

Philippe Gravisse, 18-20, rue de Presles, 75015 Paris, France

PCT No. PCT/FR79/00023, § 371 Date Nov. 9, 1979, § 102(e) Date Nov. 9, 1979, PCT Pub. No. WO79/00731, PCT Pub. Date Oct. 4, 1979
PCT Filed Mar. 9, 1978, Ser. No. 177,748
Claims priority, application France, Mar. 9, 1978, 78 06850
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—247 **10 Claims**

1. Combined solar radiation concentrator and photovoltaic converter, where incident radiation (intensity $\phi 1$, wavelength $\lambda 1$) traverses a solid matrix before arriving under the form (intensity $\phi 2$, wavelength $\lambda 2$) on at least one planar solar photovoltaic cell, said matrix being disposed at the interior of an enclosure at least a part of which, where said radiation penetrates before traversing the said matrix, is formed of a substance having a first index of refraction (n_1) on the exterior side of the enclosure, and a second index of refraction (n_2) on the interior side of the enclosure closest said matrix, said second index being substantially higher than said first index, the remainder of the said enclosure being opaque to radiation



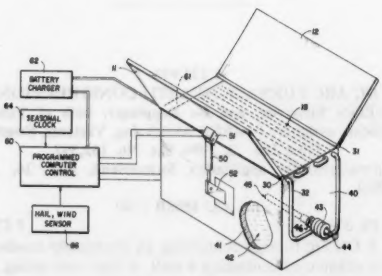
arriving said at least one photovoltaic cell also located in or forming part of said enclosure, characterized in that a plurality of substances functioning in cascade are distributed in an homogeneous manner in said matrix, the said substances absorbing and reemitting radiation the wavelength of which increases after re-emission by each one of the said substances, and the wavelength of the final radiation $\lambda 2$ corresponding to the optimum range of spectral sensitivity of the solar photovoltaic cells.

4,324,947

SOLAR ENERGY COLLECTOR SYSTEM

Robert F. Dumbeck, P.O. Box 548, Elgin, Tex. 78621

Continuation-in-part of Ser. No. 39,551, May 16, 1979, Pat. No. 4,275,711. This application Oct. 22, 1980, Ser. No. 199,591
Int. Cl.³ F24J *3/02;* H01L *31/00*
U.S. Cl. 136—248 **13 Claims**



1. A solar energy collection system comprising in combination two substantially flat pivotably movable energy directing plates with reflector surfaces adapted to change position for maximizing solar ray energy collection therewith, a reservoir tank for heat storage liquid, means mounting said plates on said

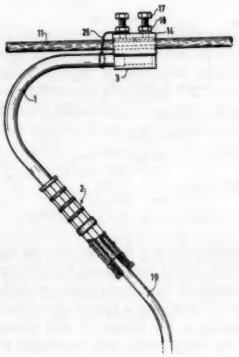
reservoir; means for heating the liquid in the reservoir with solar energy directed by said plates; and further including tubing means heating a circulating oil medium with solar energy reflected from said plate, and an interchange unit for heating water in said reservoir tank from the circulating oil comprising a heat exchange conductor element, a fitting for extending the element from the exterior into the tank, and a heat exchange fitting coupled to a portion of the element exterior to the tank comprising a wrap of tubings containing the circulating oil.

4,324,948
Patent Not Issued For This Number

4,324,949
CONNECTOR FOR CONNECTING ELECTRIC CONDUCTORS TOGETHER

Rene Grandjean, Blagny, France, assignor to Mars-Actel, Paris, France

Filed Apr. 23, 1980, Ser. No. 142,955
Claims priority, application France, Apr. 26, 1979, 79 10658
Int. Cl.³ H01R *4/20*
U.S. Cl. 174—71 R **6 Claims**

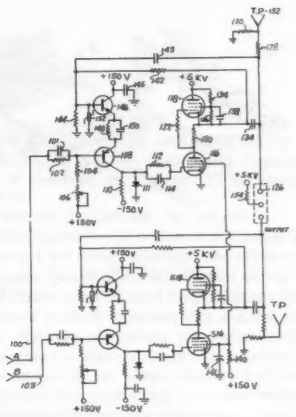


5. A connector assembly for connecting an insulated drop wire conductor to a bare overhead cable, said connector assembly comprising a sealed connector for connecting insulated electric conductors together, said connector also providing dielectric continuity of the conductor insulation in addition to electric continuity of the conductors, said connector comprising: a connector sleeve having a conductive portion made of malleable material bearing a cavity including a small diameter part remote from the end of the sleeve for accommodating a bared portion of a conductor to be connected and a larger diameter part axially outwardly thereof for accommodating an insulated portion of said conductor, and an insulating covering which completely surrounds the conductive portion and which is folded back inside the large diameter part of the cavity which accommodates the insulated portion of each conductor to be connected, and said insulated portion of said conductor and said folded back portion of said covering being commonly crimped in the connector and a conductive end fitting sealably crimped to the other end of said drop wire link conductor and encompassing in part the conductor insulation, said conductive end fitting being inserted in a U bar placed around the overhead cable so as to form a direct contact between the conductive end fitting and the overhead cable, said U bar comprising at least two independent shoes pressing the cable on the end fitting so as to insure direct contact between the overhead cable and the end fitting.

4,324,950
AMPLIFIER FOR DRIVING ELECTROSTATIC LOUDSPEAKERS

James C. Strickland, 3101 SW. 1st Ter., Ft. Lauderdale, Fla. 33315

Continuation-in-part of Ser. No. 803,931, Jun. 6, 1977. This application Jun. 25, 1979, Ser. No. 51,735
Int. Cl.³ H03F *5/00, 3/20;* H03G *1/04*
U.S. Cl. 179—1 A **9 Claims**



1. An amplifier for driving a capacitive load and adapted to receive a signal in the audio frequency range from an associated preamplifier source, the amplifier comprising: at least one power output tube arrangement including a driving tube with mean connected to drive a driven tube; and an output section connected to cooperate with said power output tube arrangement, said output section including:

(a) a feedback network;

(b) a difference amplifier, said difference amplifier including a pair of complementary drive transistors, the first of said pair of drive transistors having a collector output connected to an input of said driving tube of said power output tube arrangement, the second of said pair of drive transistors having a base input connected to an output of said driven tube of said power output tube arrangement through said feedback network, and,

wherein said feedback network includes a first resistor connected in series between said base of second transistor and said output tube arrangement, a second resistor connected between said base of said second transistor and ground to form a bleeder network with said first resistor, a third resistor connected in parallel with a capacitor disposed between the emitters of said first and second transistors to adjust gain and phase for stability, and a guard device connected to the base of said second transistor to protect said second transistor from high voltage spikes, and a compensation capacitor connected between the output of said output tube arrangement and the base of second transistor to achieve flat frequency response at said audio frequency range in said feedback network, and

the phase of said first transistor is connected to receive said audio range signals, and

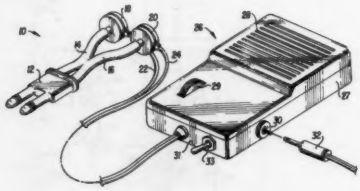
whereby said power output tube arrangement in cooperation with said transistorized difference amplifier provide low distortion, positive self-centering and high order stability power amplification of said audio range signals.

4,324,951

ACOUSTIC COUPLING SYSTEM

Bruce J. Brown, 4801 Kenmore Ave., #1022, Alexandria, Va. 22304

Filed Apr. 28, 1980, Ser. No. 144,552
Int. Cl.³ H04H *1/02*
U.S. Cl. 179—1 B **10 Claims**



1. In an audio entertainment system for a commercial vehicle, said system including acoustic piping means for transmitting a first acoustic signal from an audio source to at least one passenger position, said passenger position having an acoustic signal outlet means for connection normally with acoustic headset means for insertion in the ears of a passenger for listening to said first acoustic signal, the improvement comprising audio system means for connection with said acoustic signal outlet means for generating a second acoustic signal audible to the passenger at said passenger position so that the use of said acoustic headset means is unnecessary, said audio system means comprising acoustic coupling means for receiving said first acoustic signal, transducer means connected to said acoustic coupling means for converting said first acoustic signal into an electrical signal, amplifier means for amplifying said electrical signal, and means connected to said amplifier means for receiving said amplified electrical signal and for converting said amplifier electrical signal into said second audible acoustic signal.

4,324,952

DIRECT FUNCTION RECEIVERS AND TRANSMITTERS FOR MULTICHANNEL COMMUNICATIONS SYSTEM

Charles F. Smiley, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 935,142, Aug. 21, 1978, abandoned. This application Jun. 26, 1980, Ser. No. 163,396
Int. Cl.³ H04H *5/00*
U.S. Cl. 179—1 GS **22 Claims**

1. Apparatus for asynchronously demodulating a modulated signal having at least two common frequency, differently phased components, each of which components is modulated by a corresponding modulating signal, comprising:

envelope detector means responsive to said modulated signal to provide an envelope signal corresponding generally to the envelope of said modulated signal;

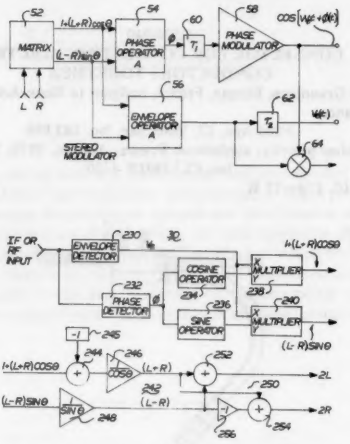
phase detector means responsive to said modulated signal to provide a phase signal corresponding generally to the phase of said modulated signal;

sinusoidal operator means responsive to said phase signal for providing an output signal which is related to said phase signal in accordance with a selected sinusoidal relationship; and

combiner means for combining said output signal and said envelope signal so as to thereby provide a demodulated output signal.

7. Apparatus for generating a composite modulated signal including a carrier component and two common frequency, differently phased components phased at equal and opposite angles on either side of said carrier component, each of said components being amplitude modulated by a corresponding source signal, comprising:

means for providing said first and second source signals;



means responsive to said first and second signals for deriving an envelope signal having an amplitude which varies as the envelope of said composite modulated signal is to vary, and for deriving a phase signal having an amplitude which varies as the phase of said composite modulated signal is to vary, with said envelope and phase signals being derived directly from said first and second source signals without intermediately modulating an RF signal therewith;

means responsive to said phase signal for providing a carrier signal whose phase varies in accordance with the amplitude of said phase signal; and

modulating means for modulating the amplitude of said carrier signal in accordance with the amplitude of said envelope signal so as to thereby provide said composite modulated signal.

4,324,953

FOUR-PARTY AUTOMATIC NUMBER IDENTIFICATION CIRCUIT ARRANGEMENTS

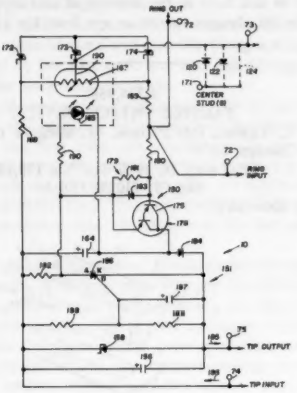
Frank L. Simokat, Babylon, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed May 19, 1980, Ser. No. 151,407
Int. Cl.³ H04M *13/00*
U.S. Cl. 179—17 A **15 Claims**

1. A station identification circuit arrangement for central office identification of a preselected one of four parties on a four-party line having tip and ring conductors when a call is initiated from the preselected party's telephone, comprising:

(a) first means for providing a ground mark to at least said tip conductor, said ground mark being normally discon-

nected from said conductor when said preselected party's telephone is on-hook, said ground mark being connected in response to a DC voltage applied by said central office to sense the presence of said mark, said first means including a light dependent resistor connected between at least said tip conductor and a reference ground and a cooperating light emitting means; and



(b) second means, responsive to a momentary interruption of loop current that occurs after the flow of loop current is established by lifting the preselected party's telephone off-hook and the application of said DC voltage on said line, for causing said first means to apply said ground mark to at least the tip conductor of said line by activating said light emitting means.

4,324,954

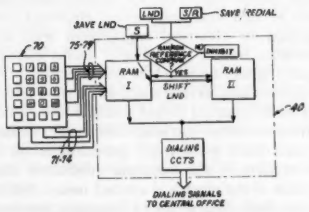
DIALING CIRCUITS AND METHODS FOR ELECTRONIC TELEPHONE SETS

Raymond G. Taylor, Shreveport, La., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 30, 1980, Ser. No. 154,677

Int. Cl.³ H04M *1/274*

U.S. Cl. 179—90 B **7 Claims**



1. A dialing circuit for an electronic telephone set which comprises:

a RAM having two memory sections (I and II), each capable of storing data signals representing a telephone number;

dialing means for generating data signals representing called numbers and for storing each number as it is dialed in section I of the RAM;

means for shifting a first LND from section I of the RAM to section II, so that the dialing means stores a second LND in RAM section I; the shifting means being automatically operable in response to dialing of each successive number to shift the previous LND to RAM section II each time a new number is dialed, so that the user at his or her option can redial either the last number dialed or the second last number by operation of a corresponding redial key associated with the dialing means and being one of the keys hereinafter recited in this claim;

a first LND redial key;

means responsive to operation of the first redial key for automatically redialing the first LND stored in RAM section II;

a second LND redial key; and

means responsive to operation of the second redial key for automatically redialing the second LND stored in RAM section I.

4,324,955

PUSHBUTTON SWITCH ARRANGEMENT

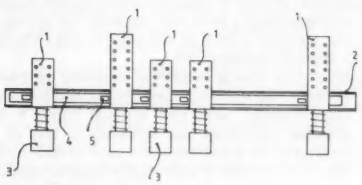
Klaus Hinze, Berlin, and Klaus B. Wisskirchen, Eppstein, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,614

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928559

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—5 E **3 Claims**



1. A pushbutton switch assembly in which a plurality of switches are mounted parallel to one another on a U-shaped mounting bar the legs of which extend perpendicular to the axes of the switches and wherein a locking device is mounted for longitudinal movement in said U-shaped mounting bar and is provided with cam surfaces for engaging movable portions of said switches, said assembly comprising:

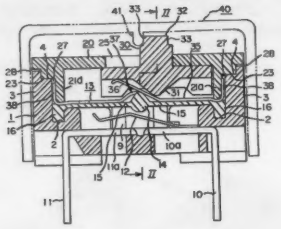
a longitudinally extending and generally rectangular continuous metallic locking bar slidably mounted in said U-shaped bar for translation therein and said locking bar having a plurality of longitudinally spaced holes therein corresponding to the longitudinal spacing between respective ones of said switches; and,

a plurality of plastic locking members respectively mounted in selected ones of said holes of said locking bar, each of said locking members comprising a base portion engaging the upper surface of said locking bar and having a depending attachment portion extending through at least one of said holes in said locking bar to locate the locking member at a fixed position relative to said locking bar, and each of said locking members including a cam portion extending upwardly from said base portion for engaging the movable portion of one of said switches, and wherein said base portion of each of said locking members is U-shaped and wherein the legs of said locking members extend downwardly for engaging edge portions of said locking bar.

4,324,956
FLUID-PROOF SLIDE SWITCH

Takahiro Sakakino, Nagaokakyo, and Hiroyoshi Yamada, Tottori, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 15, 1980, Ser. No. 149,920
Claims priority, application Japan, May 24, 1979, 54-64758
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 R 10 Claims

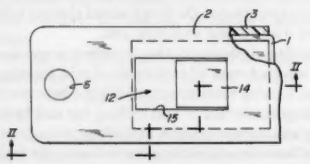


1. A fluid-proof slide switch comprising:
a box-like housing of insulating material;
a cover of insulating material attached to said housing and having a plurality of apertures;
a plurality of sliders positioned beneath of said cover, each slider having a knob projecting upwardly through said aperture and being horizontally movable;
a plurality of intermediate actuating leaf spring members positioned correspondingly to said sliders and fixed with respect to said housing and said cover;
a plurality of pairs of metal terminals aligned in said housing correspondingly with said actuating leaf spring members, one terminal in each of said pairs of said terminals having a movable member; and
a deformable sealing member of insulating material disposed between said actuating members and said terminals which, taken together with said housing, forms a fluid-proof chamber containing said terminals so that an electrical connection or disconnection of each of said pairs of terminals is accomplished individually upon the application of a downward force from the corresponding intermediate actuating leaf spring members to said sealing member in response to the horizontal movement of said corresponding sliders.

4,324,957
SLIDE SWITCH

Leo J. M. Josemans, Farmville, Va., assignor to Stackpole Components Company, Raleigh, N.C.

Filed Aug. 18, 1980, Ser. No. 178,771
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 C 6 Claims

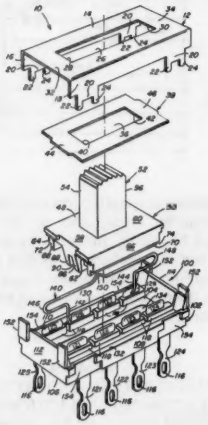


1. An electric switch comprising a housing having a top provided with a slot, an actuating member extending through said slot and provided with a bore opening downwardly inside the housing, a plunger slidably mounted in said bore and projecting from its lower end, a movable contact in the housing beneath said plunger, stationary contacts in the housing below said movable contact and engageable thereby, and a coil spring in said bore pressing the plunger down against the movable contact, the plunger and movable contact being interconnected for movement of the contact by said actuating member, the actuating member and plunger being provided with interengaging means for limiting downward movement of the plunger in said bore in the absence of said movable contact, whereby the plunger cannot escape from the actuating member.

4,324,958
TACTILE SWITCH DEVICE

Robert L. Valleau, Des Plaines, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Filed Aug. 18, 1980, Ser. No. 179,189
Int. Cl.³ H01H *15/02*
U.S. Cl. 200—16 F 11 Claims



1. An electrical switch device comprising:
a base;
electrical conductor means insulatingly secured to said base and extended therefrom;
actuator means supported for relative movement with respect to said base and having electrical contact means disposed for electrical engagement with said electrical conductor means, the actuator means including an elongated channel disposed in the direction of said relative movement and having a detent portion; and
spring means coupled to said base and having a compressible portion extended into said channel for releaseably engaging said detent portion and providing tactile indication of the position of the electrical conductor relative to the position of the electrical contact means, the compressible portion including a pair of opposing reentrant loops disposed between said base and said actuator means for enhancing the compressive resiliency of said spring means.

4,324,959
PRE-INSERTION RESISTOR MECHANISM FOR A CIRCUIT INTERRUPTING DEVICE

Walter J. Hall, Evanston, and John C. Opfer, Deerfield, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Oct. 16, 1978, Ser. No. 951,685
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP 13 Claims

1. An improved circuit interrupting device of the type having a pair of normally engaged contacts, at least one of which is relatively movable along a first path, the contacts being

selectively disengageable and engageable by such movement to open and close a gap therebetween, each contact being continuously, electrically connected to respective, opposed, circuit-connectable terminals on the device; wherein the improvement comprises:

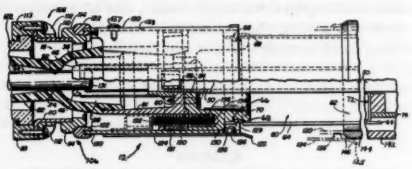
a pre-insertion resistor mechanism, which includes:

a resistor continuously, electrically connected at one end to one of the terminals, the other end of the resistor carrying a stationary electrode;

a movable electrode continuously, electrically connected to the other terminal and movable along a second path parallel to the first path into and out of engagement with the stationary electrode;

first means, responsive to disengagement of the contacts due to movement of the one contact in a first direction along the first path, for simultaneously moving the movable electrode in the first direction along the second path out of engagement with the stationary electrode so that the resistor is not in electrical parallel with the gap during such movements in the first direction; and

second means, responsive to a predetermined amount of movement of the one contact in the first direction, for moving the movable electrode along the second path in a second direction toward the stationary electrode, so that the electrodes engage prior to engagement of the contacts due to the one contact moving toward the other contact in the second direction.



7. A pre-insertion resistor mechanism for a circuit interrupting device, the device having a pair of elongated, normally engaged contacts, one of which is stationary, the other of which is axially relatively movable for separation of the contacts to open a gap therebetween, the contacts being continuously, electrically connected to respective, opposed circuit-connectable terminals on the device; and an elongated, insulative housing containing an arc-extinguishing gas, the housing coaxially surrounding the contacts and coaxially mounting the terminals; the mechanism comprising:

an elongated resistor within the housing positioned radially away from and parallel to the axis thereof, the resistor having one end continuously, electrically connected to the one contact;

a stationary electrode on the other end of, and on the axis of, the resistor;

a conductive sleeve axially movable along the axis of the housing and coaxially surrounding the other contact while being continuously, electrically connected thereto;

an electrode movable along the axis of the housing and carried by the sleeve for selective engagement with, and disengagement from, the stationary electrode upon movement of the sleeve; and

means, partially on the sleeve and positioned radially away from the axis of the housing, for

engaging the electrodes when the contacts are engaged,

disengaging the electrodes no later than the separation of the contacts, and

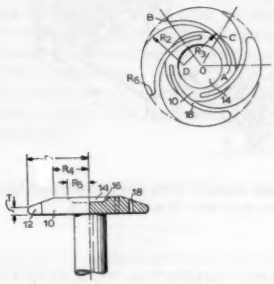
re-engaging the electrodes prior to re-engagement of the contacts.

4,324,960

WINDMILL-SHAPED ELECTRODE FOR VACUUM CIRCUIT INTERRUPTER

Shin-Ichi Aoki, and Yasushi Takeya, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1979, Ser. No. 68,102
Claims priority, application Japan, Aug. 25, 1978, 53-104013
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**



1. A windmill-shaped electrode for use with a vacuum circuit interrupter, comprising:

a circular central flat portion for receiving the arc of the interrupted current and having a central axis of rotation, and a tapered portion around the central flat portion and integral therewith for interrupting the current, the flat and tapered portions being of a common material,

said electrode having a plurality of circular arc-shaped slots extending through the electrode in the direction parallel to the axis of rotation and curving inwardly from the periphery of the tapered portion and terminating in the central flat portion for magnetically driving an electric arc, the flat portion having a radius no smaller than 0.4 times and no larger than 0.7 times the maximum radius of the windmill-shaped electrode, each of the circular arc-shaped slots being in the shape of a simple circular arc having a single radius of curvature no smaller than the radius of the flat portion.

4,324,961

DISTRIBUTION TRANSFORMER HAVING A PRIMARY DISCONNECT SWITCH

Donald J. Ristuccia, and John F. Cotton, both of Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 687,479, May 18, 1976, abandoned.
This application Feb. 16, 1979, Ser. No. 12,918
Int. Cl.³ H01H *33/68, 75/00;* H02H *7/04*
U.S. Cl. 200—150 R **10 Claims**

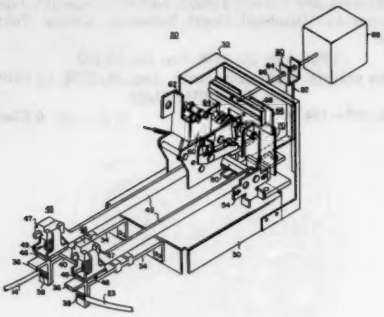
4. An oil-filled distribution transformer, comprising:

a housing;

primary and secondary coils supported within said housing;

a high voltage disconnect switch disposed within said housing and connected to said primary coil, said disconnect switch being operable between a closed position permitting current flow through said primary coil and an open position preventing current flow through said primary coil, said switch comprising a metal base, two pairs of stationary contacts, one contact of each pair being interconnected, insulating means extending outward from said base in a plane parallel to said base and supporting said stationary contacts, two bridging contacts each movable between a closed position connecting the contacts of each stationary contact pair and an open position spaced away from said stationary contact pairs, two metal contact arms, each arm supporting one of said bridging contacts,

means for insulating said bridging contacts from said contact arms, and an operating mechanism operable to



move said contact arms and operate said bridging contact between open and closed positions.

4,324,962

MEMBRANE SWITCH HAVING A PUFF INK SPACER

Edwina K. Dulen, Fox Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Oct. 14, 1980, Ser. No. 196,446

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—159 B **15 Claims**

1. In a membrane switch of the type having a substrate and a flexible membrane, each having a set of conductors formed thereon, the conductors being in facing relation, and a spacer disposed between the sets of conductors to normally hold them in spaced, non-contacting relation, the spacer having openings which allow contact between the conductor sets in response to actuating pressure exerted on the switch, the improvement comprising a spacer formed of puff ink.

4,324,963

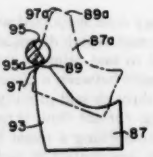
BEVELED LATCH FOR CIRCUIT BREAKER CROSS-REFERENCE TO RELATED APPLICATIONS

Alfred E. Maier, and Louis N. Ricci, both of Chippewa Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 21, 1980, Ser. No. 151,860

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—318 **9 Claims**



1. A circuit breaker, comprising:

(a) a support base;

(b) movable electrical contact means movably disposed upon said support base for controlling the electrical current conducting status of an electrical conductor;

(c) chargeable force supplying means disposed upon said support base for engaging in a discharging operation from a charged state to thus supply the force necessary to move said movable contact means;

(d) operating mechanism means disposed upon said support base and mechanically interconnected with said force supplying means and said electrical contact means for transferring said force from said discharging operation to said movable contact means to move said movable contact means, said operating mechanism means including a plurality of latch members which are also movable under the influence of said discharging operation and which when captured in a latched position maintain said force supplying means in the charged state and which when generally simultaneously released within time limits to an unlatched position allow said discharging operation to begin; and

(e) movable latching rod means including a rotatable latching rod having a surface notch movably disposed upon said support base for latching said latch members when in a first latching rod position and for releasing said latch members when moved to a second latching rod position, the initiation of said later movement being provided from a stimulus which is independent of said latch members, latch members having an urging surface thereon which maintains a position of sliding mechanical contact with the surface of said rod after said independent initiation of said later movement and consequent release of said one latch member has begun, said position of sliding mechanical contact between said urging surface and said surface notch operating to complete the movement of said rod to said second latching rod position under the influence of said discharging force supply means, said latter movement thus completing the generally simultaneous release of other latch members within said time limits.

4,324,964

DEVICE FOR EXTENDING PLUNGER DRIVES

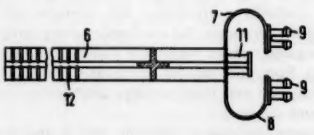
Georg Edenharter, Vilshofen, and Friedrich Ebnet, Köfering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 135,123

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914783

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—331 **4 Claims**



1. In a device for extending the point of actuation of an electric switch gear by means of an extension element which can be inserted between a point of actuation and a pushbutton of the switchgear, the improvement in which:

the switchgear is provided with at least two fastening openings, and

the extension element terminates at one end in elastically resilient arms forming a C with the open side of the C extending over the pushbutton of the switchgear, and further comprising:

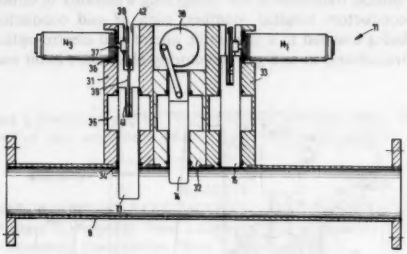
an elastically resilient detent projection carried on each arm, each projection adapted to snap into one of the fastening openings.

4,324,965

MICROWAVE HEATING METHOD AND APPARATUS INCLUDING ADJUSTABLE TUNING MEMBERS

Gerd Naumann, and Bernd Treine, both of Hannover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, An der Breiten Wiese, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 60,365, Jul. 25, 1979, abandoned. This application Nov. 27, 1979, Ser. No. 97,656
Int. Cl.³ H05B 6/70
U.S. Cl. 219—10.55 F 4 Claims



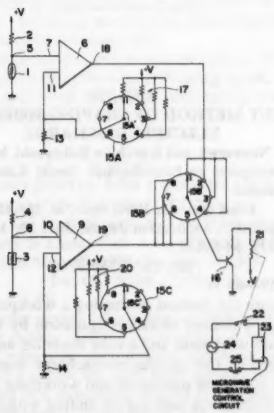
1. A method of matching a microwave heater, for the purpose of reducing microwave energy reflected by the load wherein microwave energy is supplied to a treatment chamber from a microwave energy source by way of a hollow waveguide of substantially rectangular cross-section and matching is effected by means of adjustable tuning members which are disposed in said hollow waveguide, the method comprising measuring the microwave energy reflected by the load and, when a given level of reflected microwave energy is exceeded, adjusting two tuning members with one of the tuning members having a higher adjustment speed than the other.

4,324,966

MENU RESPONSIBLE AUTOMATIC SENSOR SELECTION IN A COOKING UTENSIL

Takeshi Tanabe, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 4, 1980, Ser. No. 109,501
Claims priority, application Japan, Jan. 17, 1979, 54-4642
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.55 B 10 Claims



1. A cooking utensil comprising:

cooking heat source means;

at least two sensor means for detecting a cooking condition performed by said cooking utensil and developing output signals in response thereto;

menu selection means for selecting a desired cooking menu to be conducted by said cooking utensil, said menu selection means selecting one of said sensor means in accordance with the selected desired cooking menu and establishing a reference level preset; and

control circuit means responsive to said reference level preset and to the output signal from the selected sensor means for controlling the operation of said cooking heat source means in response thereto, said menu selection means further comprising:

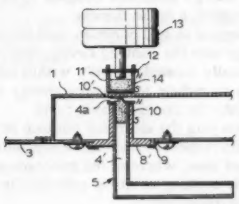
correlation means for correlating the selection of one of said sensor means with the selection of said desired cooking menu.

4,324,967

MICROWAVE HEATING APPARATUS HAVING MAGNETIC COUPLING FOR DRIVING THE ANTENNA

Nobuo Ikeda, and Hirofumi Yoshimura, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 57,676, Jul. 16, 1979, abandoned. This application Sep. 5, 1980, Ser. No. 184,322
Claims priority, application Japan, Jul. 18, 1978, 53-88194
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 F 2 Claims



1. A microwave heating apparatus comprising:

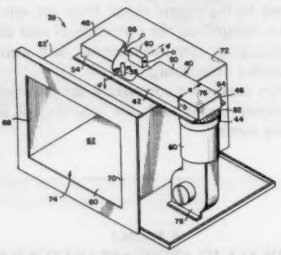
a heating chamber; a high frequency oscillator; a wave guide between said oscillator and said chamber for leading electric radiation from said oscillator to said chamber and having a wall which is on the side of said wave guide closest to said chamber; a rotatable antenna electromagnetically coupling said wave guide with said heating chamber for distributing high frequency radiation in said chamber, said wave guide being made of a non-magnetic material and said rotatable antenna being made of a non-magnetic hollow tubular material, a sleeve bearing member having a flange portion attached to said wall and a sleeve portion integral with said flange and extending into said wave guide perpendicular to said wall, said rotatable antenna having an inner end portion extending into said sleeve portion of said wave guide and rotatably mounted therein and having an outwardly extending flange on the inner end of said inner end portion rotatably bearing against the inner end of said sleeve portion; a first magnet mounted within the hollow inner end portion of said rotatable antenna; and an antenna drive means outside said wave guide and in spaced opposed relation to said first magnet and forming a magnetic coupling therewith for rotating said antenna when said antenna drive means is operated.

4,324,968

MICROWAVE OVEN CAVITY EXCITATION SYSTEM PROVIDING CONTROLLED ELECTRIC FIELD SHAPE FOR UNIFORMITY OF ENERGY DISTRIBUTION

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 3, 1980, Ser. No. 203,091
Int. Cl.³ H05B 6/74
U.S. Cl. 219—10.55 F 7 Claims



1. An excitation system for a microwave oven cooking cavity having electrically conductive walls, said excitation system promoting time-averaged uniformity of energy distribution and comprising:

a rectangular feed waveguide extending along the outer surface of one of the cooking cavity walls, one wall of said waveguide being common with at least a portion of said one wall of the cooking cavity;

a microwave energy generator coupled to said feed waveguide to establish a mode therein;

a coupling aperture in said common wall for feeding microwave energy into the cooking cavity, said coupling aperture electrically located laterally within said feed waveguide so as to radiate microwave energy polarized in a first sense into the cooking cavity; and

a device for varying the electrical position of said coupling aperture with respect to said feed waveguide centerline as a function of time, whereby the microwave energy radiated into the cooking cavity is periodically changed to a second polarization sense.

4,324,969

ELECTRICAL DISCHARGE MACHINING SYSTEM WITH OPTICAL ISOLATION OF A GAP MONITOR FROM REMOTE CONTROL CIRCUIT

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 5, 1980, Ser. No. 118,791
Int. Cl.³ B23P 1/02
U.S. Cl. 219—69 C 1 Claim

1. An electrical discharge machining (EDM) system comprising:

mechanical components including a tool electrode forming an EDM gap with a workpiece and assembled together to form an EDM machine tool;

power supply means connected to said EDM gap for providing a succession of machining pulses controlledly across said gap between said tool electrode and said workpiece in said EDM machine tool;

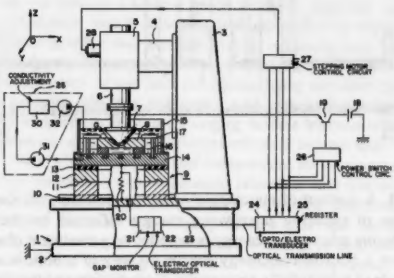
machining fluid supply means connected with said EDM machine tool for delivering a machining fluid controlledly to said gap;

drive means operatively connected to at least one of said mechanical components for relatively displacing said tool electrode and said workpiece;

a electrical control circuit unit disposed remote from said gap for controlling at least one of said means;

a gap-monitoring electrical circuit unit disposed remote from and spaced from said electrical control circuit unit and installed in a chamber at a portion of said mechanical components located in the vicinity of said EDM gap for providing a plurality of electrical monitoring signals representing different classes of gap discharge conditions, said gap monitoring circuit unit having an output provided with a plurality of electro-optical transducers assigned to said different classes of gap discharge conditions for converting said electrical monitoring signals to corresponding optical signals respectively; and

an optical transmission line comprising a plurality of optical conductors bundled together, each of said conductors being coupled to a respective one of said electro-optical transducers in said gap monitoring electrical circuit unit,



said optical conductors leading out of said chamber and across a space between said chamber and said electrical control circuit unit, into said electrical control circuit unit for transmitting across said space and between said electrical control circuit unit and said gap monitoring electrical circuit unit, said optical signals individually, said control circuit unit having an input provided with a plurality of opto-electrical transducers each coupled to a predetermined one of said optical conductors for reconverting said optical signals to respective electrical monitoring signals, said control circuit unit having logic circuit means responsive to said reconverted electrical monitoring signals for producing control signals for controlling said at least one of said means.

4,324,970

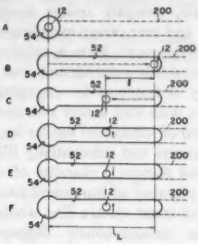
WIRE CUT METHOD OF SHAPING WORKPIECE BY ELECTRIC DISCHARGE

Yoshifumi Nanasawa, and Kazuhiko Kobayashi, both of Nagoya, Japan, assignors to Mitsubushiki Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,457
Claims priority, application Japan, Jun. 26, 1979, 54-80530; Jun. 26, 1979, 54-80531
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W 9 Claims

1. In a wire cut method of shaping a workpiece by electric discharge in a desired work configuration by relative movements of said workpiece and a wire electride, an improvement characterized in that an electro-discharge machining of the workpiece in a waste portion of said workpiece is stopped and said wire electrode is backwardly shifted without being energized for a predetermined distance along the machine portion from said stopped position in said waste work and said wire

electrode is shifted in a direction perpendicular to the direction of the machined portion at said shifted position so as to measure a discharge gap by contacting said wire electrode with a wall of said workpiece whereby an offset is calculated.

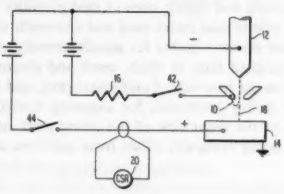


4,324,971

TORCH HEIGHT ACQUISITION USING ARC TRANSFER

Michael B. Frappier, West Lebanon, N.H., assignor to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed Jul. 9, 1980, Ser. No. 167,095
Int. Cl.³ B23K *9/06*
U.S. Cl. 219—121 PV **15 Claims**



1. A plasma torch system of the type wherein a non-transferred arc is generated between a torch cathode and a torch tip, said system further being of the type wherein a torch main arc operating height is initially acquired and is then maintained during a cutting or welding operation, said system comprising a means for lowering said torch toward a workpiece while said non-transferred arc is being generated to establish a main arc between said torch and workpiece, the improvement comprising:

means for sensing establishment of said main arc, said sensing means producing an electrical indicating signal upon establishment of said main arc;

means for stopping the downward movement of said torch in response to said electrical indicating signal, the height at which said torch is stopped constituting said main arc operating height.

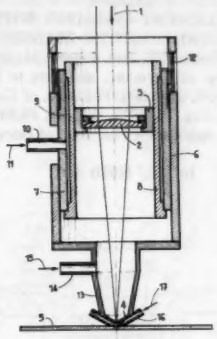
4,324,972

PROCESS AND DEVICE FOR LASER-BEAM MELTING AND FLAME CUTTING

Alfred Furrer, and Hans Wehrli, both of Winterthur, Switzerland, assignors to Laser-Work A.G., Winterthur, Switzerland

Filed Nov. 18, 1980, Ser. No. 207,926
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 FS **6 Claims**

1. A laser beam device for melting and flame cutting, welding, sublimate cutting, drilling or marking, as well as finish-machining of materials, comprising a focussing lens for the laser beam and a nozzle for a gas feed, wherein the focussing lens is mounted in a swing-free manner for adjustment in the direction of the optical axis coaxial with the laser beam by means of an adjusting ring by which it is positively located on its longitudinal axis, the lens mounting comprising an adjustable shell structure in screw-threaded engagement with the adjusting ring and positioned with an accurate fit in a housing the internal section of which corresponds to the outer section of the shell, and wherein the adjustable shell and the housing are each of hollow cylindrical section and the shell has a continuous internal screw thread for the purpose of extracting a lens mount in which the lens is supported.

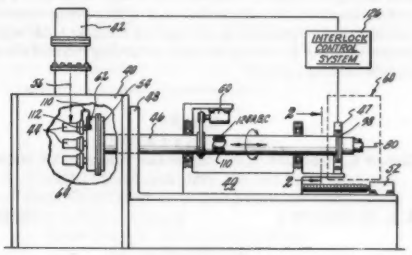


4,324,973

ENERGY BEAM DRILLING APPARATUS HAVING OPTICAL FIBER LINK POSITION SENSOR

David F. Kirwan, West Simsbury, and John R. Naumec, Willimantic, both of Conn., assignors to United Technologies Corp., Hartford, Conn.

Filed Nov. 21, 1980, Ser. No. 208,901
Int. Cl.³ B23K *15/00, 26/04;* **G01D** *5/34;* **G08B** *5/00*
U.S. Cl. 219—121 EA **3 Claims**



1. Apparatus for drilling and welding using beam energy, comprising a controlled environment chamber; a source of beam energy, the output of which is responsive to a beam signal, connected to the chamber; movable fixtures mounted on a rotatable housing within the chamber; an optical fiber link operating in combination with the fixtures comprising, a light source; a detector for generating the beam signal upon incidence of light from the source, the detector and source being mounted on parts of the apparatus located external to the chamber; a segmented optical fiber serially connecting the source and the detector, the fiber having a junction located in proximity to each of the fixtures, each junction formed by two segments of the fiber, at least one of each of said segments of the fiber being movable in response to movement of a fixture, each junction making a couple which is selectively transmittive of light through a portion of the link upon desired positioning of the fixture; and, seals along the fiber where it enters and leaves the chamber, to preserve the chamber environment; the fiber link being light transmittive when all the fixtures are

moved on the housing to their respective desired positions, to thereby generate the beam signal which enables output from the beam energy source.

4,324,974

HEATING ELEMENT ASSEMBLY WITH A PTC ELECTRIC HEATING ELEMENT

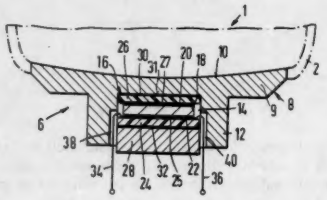
Herbert Steiner, Traunstorf, and Johann Magg, St. Georgen, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräge GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 14, 1979, Ser. No. 66,339

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835742

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—553 **7 Claims**



1. A heating element assembly for insertion in a recess in a highly heat conducting material to thereby transfer heat from the inserted heating element assembly through the heat-conducting surfaces of the recess into the heat conducting material, which comprises an electric heating element of a material with positive temperature coefficient having planar opposite sides, planar electrodes which are electrically and thermally conductive contacting the two opposite sides, planar sheets of thermally conductive and electrically non-conductive insulating material covering the two opposite sides, the combination therewith of said sheets of insulating material coated on their side facing the heating element over a large area with a solder and soldered to the electrodes, said solder being electrically and thermally conductive and having electric leads and said planar sheets of insulating material extending beyond the edges of said heating element.

4,324,975

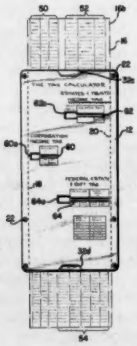
TAX CALCULATOR

Robert L. Rees, 233 N. Michigan Ave., Chicago, Ill. 60601

Filed Feb. 19, 1980, Ser. No. 122,279

Int. Cl.³ G06G *1/02*; G06C *3/00*

U.S. Cl. 235—70 A **10 Claims**



1. A tax calculator apparatus comprising: a substantially flat front cover member of predetermined width and of predetermined length substantially greater than said predetermined width, a substantially flat rear cover member of substantially the same length and width of said front cover member, a pair of relatively narrow, elongate spacer members interposed between said front and rear cover members and at opposing lateral sides thereof so as to form a relatively thin pocket having enclosed lateral side portions and open top and bottom portions, a plurality of fasteners for engaging said front and rear cover members with said spacer members to define said pocket, an insert card of substantial similar length to said front and rear cover members and substantially filling said pocket and slidably mounted therein, a plurality of vertical columns each comprising a plurality of horizontal lines on both front and rear sides of said insert card, a first window in said front cover member for simultaneously exposing horizontally aligned lines in first, second and third adjacent ones of said columns, a second window and a third window in said front cover member positioned respectively for simultaneously exposing horizontally aligned lines in said first column and in fourth, fifth, sixth and seventh ones of said plurality of columns, and a fourth window in said front cover member positioned for simultaneously exposing horizontally aligned lines in eighth and ninth ones of said plurality of columns, a fifth window in said rear cover member for simultaneously exposing horizontally aligned lines in first, second and third ones of said plurality of columns formed on the rear side of said insert card, a sixth window formed in said rear cover member for simultaneously exposing horizontally aligned lines in fourth, fifth, sixth, seventh and eighth ones of said plurality of columns on said rear side of said insert card and a seventh window formed in said rear cover member for simultaneously exposing a horizontally aligned lines in ninth, tenth and elventh ones of said columns on the rear side of said insert card, said first and fourth windows being positioned for exposing horizontally aligned columns of the front side of the insert card, and said second window being vertically offset from said first and fourth windows.

4,324,976

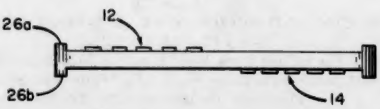
HAND-HELD CALCULATOR OR SIMILAR KEYBOARD DEVICE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Feb. 8, 1980, Ser. No. 120,005

Int. Cl.³ G06C *7/02*

U.S. Cl. 235—145 R **6 Claims**

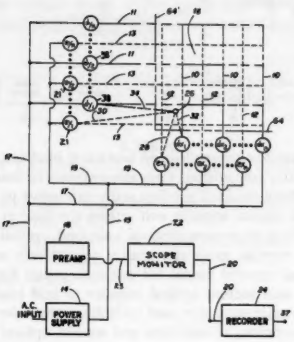


1. A hand-held keyboard device comprising a housing, a first keyboard on the front housing face, a second keyboard on the rear housing face, the housing being adapted to be held in a user's hand, such that in one hand position the first keyboard is in position for use, and upon rotation of the user's wrist, the second keyboard is in position for use without repositioning of the housing in the hand.

4,324,977
SYNTHESIZED TARGET SYSTEM

Malcolm M. Brauer, 3830 Tanglefoot Ct., Bettendorf, Scott County, Iowa 52722

Continuation-in-part of Ser. No. 18,534, Mar. 8, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,568
Int. Cl.³ G01V 9/04
U.S. Cl. 250—222 R 10 Claims



1. A synthesized target system comprising:

a power supply means for providing electrical energy to said target system;

overlapping emitter means for generating a target plane in the form of an electromagnetic energy curtain;

overlapping zone detector means operatively disposed in said target plane for detecting reflections from a plurality of projectiles, for simultaneously detecting the positions of said projectiles within said target plane, for determining the order in which said projectiles penetrate said target plane, and for generating electrical output signals in response to said reflections;

monitoring means electrically connected to said amplifying means for instaneously observing the position of said projectiles in said energy curtain which includes;

trigger means for monitoring a separate output signal for each projectile reflection, for discriminating between said projectiles and background noise, and for blocking spurious signals;

and

pulse shaping means for broadening the width of said amplified detector output signals;

recording means for generating real-time archival records for storage and retrieval of the data output of said pulse shaping means; and

rails means for protecting and holding said emitter means and said detector means operatively disposed about said target plane which includes;

a portable first optical rail member disposed along an x-axis of said target plane;

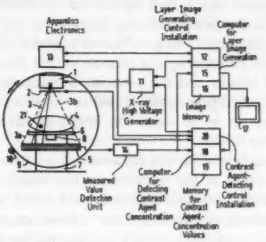
a portable second optical rail member disposed along a y-axis of said target plane; and

disconnect joint means for providing easy and accurate erection and optical alignment of said first and second portable rail members.

4,324,978
TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

Willi Kalender; Gerhard Linke, and Manfred Pfeiler, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,407
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928825
Int. Cl.³ A61B 6/00
U.S. Cl. 250—445 T 2 Claims

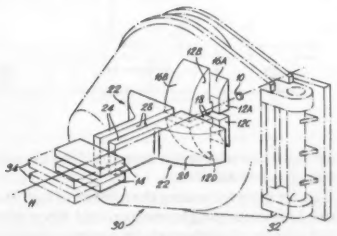

Apparatus Electronics
Layer Image Generating Control Installation
Computer for Layer Image Generation
X-ray High Voltage Generator
Image Memory
Measured Value Detection Unit
Computer for Detecting Contrast Agent Concentration
Memory for Contrast Agent-Concentration Values
Contrast Agent-Detecting Control Installation

1. Tomographic x-ray apparatus for the production of transverse layer images of a radiography subject, comprising a patient support, a radiation measuring arrangement including a radiation source which generates a beam of rays penetrating the radiography subject, whose cross sectional extent perpendicular to the layer plane is equal to the layer thickness, and a radiation receiver which determines the radiation intensity behind the subject, comprising a drive device for the measuring arrangement for producing rotational movement of the radiation measuring arrangement, and comprising a measured value converter for the conversion of the signals supplied by the radiation receiver into a tomographic image, means (10) for locking the measuring arrangement against rotation during the processing of the measuring signals supplied by the radiation receiver, means (8) for locking the patient support (6) against longitudinal movement during the processing of the measuring signals, and an adjustable diaphragm (2) for restricting the beam of rays (3) to a selected portion of the layer plane.

4,324,979
VARIABLE NEUTRON COLLIMATOR

David K. Bewley, London, and Kenneth Finding, Camberley, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 21, 1979, Ser. No. 50,743
Int. Cl.³ G21F 5/04
U.S. Cl. 250—505 1 Claim



1. A variable neutron collimator comprising two pairs of neutron-absorbing blocks spaced from the position of a source of neutrons,

the first pair of blocks being of two-component form, each

component having a surface remote from the position of the neutron source which is curved and concentric with said position, each component of each block having a beam-defining face adjacent the direction of the required beam, the faces together defining first opposite sides of a quadrilateral aperture divergent from the position of the source, and a pair of asscoiated extensions of the block spaced from the first pair of blocks in the direction of the beam, the extensions each having a beam-defining face which together also define the same two opposite sides of the divergent aperture; the total thickness of each two-component block and associated extension immediately adjacent the beam-defining face and in the general direction of the beam being sufficient to absorb substantially all neutrons emitted by the source in that direction; the first pair of blocks and the associated extensions being rotatable in a first plane orthogonal to the axis of the divergent aperture so as to vary the angle of divergence of the aperture;

the second pair of blocks each having a surface remote from the position of the neutron source which is curved and concentric with said position, each block having an integral extension beyond the curved surface, each block and integral extension having a continuous beam-defining face adjacent the direction of the required beam, the faces together defining second opposite sides of a quadrilateral aperture divergent from the position of the source; the thickness of the block and extension immediately adjacent the beam-defining face and in the general direction of the beam being sufficient to absorb substantially all neutrons emitted by the source in that direction; the second pair of blocks and integral extensions being rotatable in a second plane orthogonal to the first plane and to the axis of the divergent aperture so as to vary the angle of divergence of the aperture; the second pair of blocks being between the first pair of blocks and the associated extensions;

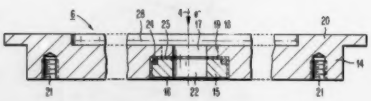
and a fixed shield of neutron-absorbing material arranged to absorb neutrons travelling in directions radial from the neutron source which pass through only the curved surfaces of any block, the sum of the thicknesses of the block and the shield in directions radial from the source being sufficient to absorb all neutrons emitted by the source in that direction.

4,324,980

ELECTRON EXIT WINDOW ASSEMBLY FOR A LINEAR ACCELERATOR

Edgar B. Symmons, Walnut Creek, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Jul. 21, 1980, Ser. No. 170,607
Int. Cl.³ G02B *5/00*; H01J *7/26*
U.S. Cl. 250—505 **14 Claims**



1. An electron exit window assembly for a linear accelerator, comprising in combination:

(a) a cover plate for sealing the interior of said linear accelerator in a vacuum-tight manner, said cover plate having a first opening therethrough for passing a beam of electrons;

(b) an insert piece of titanium inserted into said first opening in a vacuum-tight manner, said insert piece having a second opening therethrough; and

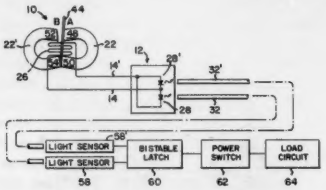
(c) an electron exit window made of a thin titanium foil and connected across said second opening in a vacuum-tight manner.

4,324,981

LIGHT TRANSMISSION LOAD CONTROL SYSTEM

Glen E. Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 21, 1980, Ser. No. 152,265
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **13 Claims**



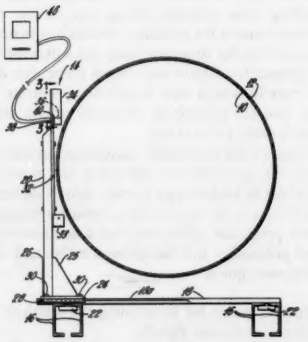
1. Apparatus for controlling an electrical load settable in at least two states, comprising: optically responsive load control means for setting the load in a first state responsive to presentation of a first optical impulse and setting the load in a second state responsive to presentation of a second optical impulse; and optical impulse generator means operatively associated with said load control means for presenting said first optical impulse and said second optical impulse to said load control means in alternate sequence, and including means for controlling the occurrences of said first and second optical impulses and for indicating which of said optical impulses is presented to indicate the state in which the load is set.

4,324,982

PIPE WALL THICKNESS MONITORING APPARATUS

Peder U. Poulsen, Fredensborg, Denmark, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 861,783, Dec. 19, 1977, abandoned. This application Aug. 2, 1979, Ser. No. 63,296
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—560 **7 Claims**



1. A wall thickness monitoring apparatus for use with a rotatable mandrel having a cylindrical surface for receiving liquid resin hardenable to form a tubular body, the apparatus comprising a source of light mounted adjacent the cylindrical surface of the mandrel substantially along a tangent to a cross section thereof and on one side of a reference plane perpendicular to the tangent and containing the axis of rotation of the mandrel, a sensing and indicating means mounted adjacent the cylindrical surface of the mandrel substantially along the tangent but on the opposite side of the reference plane, the source of light and the sensing and indicating means being disposed entirely on one side of a plane perpendicular to the reference plane and containing the axis of rotation of the mandrel, and

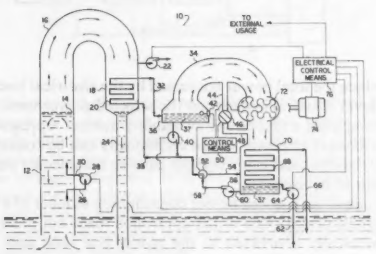
means for adjusting the source of light and the sensing and indicating means in a direction parallel to the reference plane toward or away from the mandrel surface to enable the reading on the sensing and indicating means, determined by the position of the shadow line of the mandrel surface on the sensing and indicating means caused by the intrusion of the mandrel surface into the rays of light emanating from the source of light, to be set at a zero point on the sensing and indicating means before the tubular body is formed on the mandrel, whereby the wall thickness of a tubular body formed on the mandrel may be indicated by the change, caused by the presence of the tubular body, in the position of the shadow line from the zero point on the sensing and indicating means.

4,324,983

BINARY VAPOR CYCLE METHOD OF ELECTRICAL POWER GENERATION

Gerald F. Humiston, Apartment E 202, 2909 Gulf to Bay Blvd., Clearwater, Fla. 33519

Filed Sep. 15, 1977, Ser. No. 833,663
Int. Cl.³ F01K *25/06*
U.S. Cl. 290—1 R **12 Claims**



1. A heat pump system for producing electrical power, comprising in combination:

a first and a second heat pump for a first and a second fluid, respectively;

said first heat pump comprising a first evaporator and a first condenser interconnected by a first conduit;

said second heat pump comprising a second evaporator and a second condenser interconnected by a second conduit;

said first heat pump being independent from said second heat pump enabling said first and second heat pumps to operate without intermingling the first and second fluids;

means for introducing warm first fluid into said first evaporator;

a closed first heat exchanger disposed in said first condenser for absorbing heat from the condensing first fluid;

condenser return conduit means connecting said second condenser to said second evaporator and extending through said closed first heat exchanger for heating the condensed second fluid prior to introduction into said second evaporator;

a prime mover interposed in said second conduit for providing mechanical energy from the mass flow of vapor from said second evaporator to said second condenser;

an electrical generator coupled to said prime mover to convert said mechanical energy into an electrical power output; and

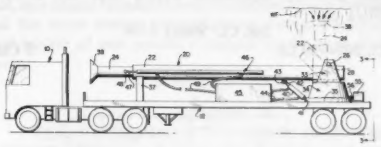
electrical control means connected to said electrical generator for directing the electrical power output thereof to operate the heat pump system and for directing any excess electrical power output for external usage.

4,324,984

PORTABLE HYDROGENERATING APPARATUS

Peter M. Borgren, Duluth, Minn., assignor to Hydrodynamic Energy Systems Corp., Superior, Wis.

Filed Feb. 3, 1981, Ser. No. 231,055
Int. Cl.³ F03B *13/10*
U.S. Cl. 290—54 **16 Claims**



1. Portable hydrogenerating apparatus comprising:

(a) a transportable support vehicle,

(b) portable tube means mounted on said support vehicle and adapted to be transported to and from a site having a potential energy water source,

(c) means for moving and supporting said portable tube means so as to position the upper end thereof in the path of water flow from said water source, the water flowing gravitationally through said tube means thereby providing a pressure head, and

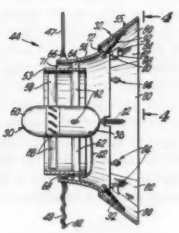
(d) transportable turbine generator means associated with the discharge end of said tube means and receiving water under head pressure from said tube means, whereby electrical energy can be produced.

4,324,985

PORTABLE WIND TURBINE FOR CHARGING BATTERIES

Richard A. Oman, Huntington, N.Y., assignor to Grumman Aerospace Corp., Bethpage, N.Y.

Filed Jul. 9, 1980, Ser. No. 167,170
Int. Cl.³ F03D *7/04, 1/04*
U.S. Cl. 290—55 **26 Claims**



25. A wind turbine assembly comprising:

a wind turbine;

a set of ducts enclosing an axis of said turbine, said ducts being of progressively larger diameter to provide a plurality of slots therebetween to control the flow of wind past blades of said turbine, one of said ducts being articulated for varying the cross sectional area thereof to further control the flow of wind past said blades; and

deployment means coupled to said articulated duct for alternatively opening said articulated duct to a deployed state upon a manual triggering of said opening, and closing said articulated duct to a stowed state, upon a tiggering by said wind.

4,324,986
SWITCH POSITION INDICATING MEANS FOR AUTOMOBILES

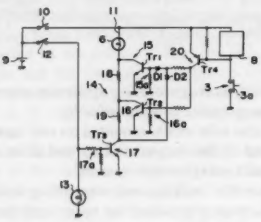
Takanori Hara; Makoto Yoshinaga; Haruto Yano, and Noriyasu Matumura, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 29, 1980, Ser. No. 191,848

Claims priority, application Japan, Sep. 29, 1979, 54-135469[U]

Int. Cl.³ B60Q *3/04*

U.S. Cl. 307—10 LS **5 Claims**



1. An electric system for automobiles comprising electric power source means, electrically operated means providing a load on the power source means, control switch means disposed between the power source means and the electrically operated means for controlling an electric power supply from the power source means to the electrically operated means, said switch means having an unactuated position and at least one actuated position and provided with manually actuatable means, switch illuminating means disposed in the vicinity of the manually actuatable means to illuminate the same, electric circuit means for energizing the illumination means, automobile light means adapted for use in dark conditions, light switch means provided between the power source means and the automobile light means for controlling an electric power supply from the power source means to the light means, first switch means connected with the switch illuminating means and being adapted to close the electric circuit means only when the control switch means is in the actuated position and the light switch means is not actuated, so as to energize the switch illuminating means, second switch means connected through a first resistance means with the switch illuminating means in parallel with the first switch means and being adapted to close the electric circuit means when the control switch means and the light switch means are actuated, so as to energize the switch illuminating means through the first resistance means, third switch means connected through a second resistance means which is of a resistance higher than that of the first resistance means with the switch illuminating means in parallel with the first and second switch means and being adapted to close the electric circuit means when the light switch means is actuated and the control switch means is not actuated so that the switch illuminating means is energized through the second resistance means.

4,324,987
SYSTEM AND METHOD FOR OPTIMIZING SHED/RESTORE OPERATIONS FOR ELECTRICAL LOADS

C. Gardner Sullivan, II, Phoenix, and Walter P. Hedges, Laveen, both of Ariz., assignors to Cyborex Laboratories, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 154,775, May 30, 1980, which is a continuation of Ser. No. 909,850, May 26, 1978, Pat. No. 4,211,933. This application Sep. 26, 1980, Ser. No. 191,424

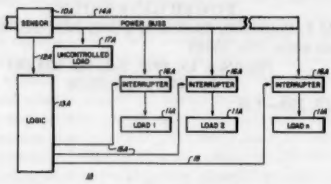
Int. Cl.³ H02J *3/14*

U.S. Cl. 307—35 **30 Claims**

1. A method for controlling delivery of electrical energy from a power line to an establishment having a plurality of electrical loads in order to maintain the total power delivered to the electrical loads below a selected power limit, the electrical loads including a plurality of controlled loads which can be electrically connected to and disconnected from the power line in accordance with priorities of the controlled loads by means of a control system, the control system including a plurality of load switching means for controllably connecting the controlled loads to and disconnecting the controlled loads from the power line the control system also including power measuring means for measuring power delivered from the power line to the electrical loads, said method comprising operating a processor to effect the steps of:

(a) computing and storing a power consumption number for any one of the controlled loads when that controlled load is electrically disconnected from the power line;

(b) comparing the selected power limit to the total power consumed by the electrical loads and, if the total power consumed by the electrical loads exceeds the selected power limit, electrically disconnecting a sufficient number of the controlled loads, in order of increasing priority, to



reduce the total power consumed by the electrical loads to a level which is lower than the selected power limit;

(c) computing a first power availability number representing an amount of power which additionally can be consumed by the electrical loads without causing the selected power limit to be exceeded;

(d) comparing a stored power consumption number of a first highest-priority one of the controlled loads not presently electrically connected to the power line with said first power availability number and electrically connecting said first controlled load to the power line of said electrical connecting of said first controlled load will not cause the selected power limit to be exceeded; and

(e) electrically disconnecting a second, lowest-priority one of the controlled loads presently electrically connected to the power line from the power line if said stored power consumption number of said first controlled load is greater than said first power available number and the priority of said second controlled load is lower than the priority of said first controlled load.

4,324,988
SOLID-STATE IMAGING DEVICE DRIVING SYSTEM

Yasuo Takemura, Kawasaki, and Yoshitaka Katayama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 949,136, Oct. 6, 1978, abandoned. This application Jul. 29, 1980, Ser. No. 173,420

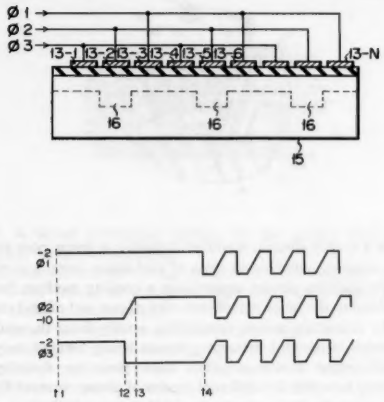
Claims priority, application Japan, Oct. 6, 1977, 52-119451

Int. Cl.³ G11C *19/28;* H03K *3/42;* H01L *29/78, 27/14*

U.S. Cl. 307—221 D **12 Claims**

1. A system for driving a solid-state imaging device such that a storage mode and a transfer mode are alternated, wherein said imaging device comprises a charge transfer device including a semiconductor substrate, an insulating film formed on said semiconductor substrate and a plurality of electrode groups, each of which includes at least first and second electrodes and forms one picture element, wherein said storage mode includes at least one integration and shifting, and in which in the storage mode a first level signal and a second level signal are supplied respectively to the first and second elec-

trodes during a first period of time, thereby forming a first potential well in which first charges corresponding to an optical image are integrated and then applying said first and second level signals respectively to the second and first electrodes during a second period of time following the first period of time, thereby forming a second potential well to which the first charges integrated are shifted from the first potential well by at least one of the electrodes corresponding to one element and in



which second charges corresponding to the optical image are integrated to be added to the first charges, and in the transfer mode high frequency pulse signals in different phases are supplied to the first and second electrodes, thereby transferring the charges integrated from the second potential well to an output circuit; wherein the first and second time periods have a substantially greater time duration than a period of said high frequency pulse signals supplied to said first and second electrodes in the transfer mode.

4,324,989

SOLID-STATE RELAY

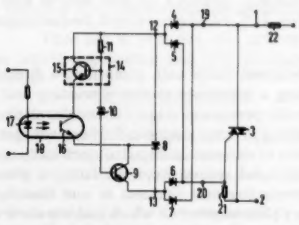
Hans Stut, Gröbenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,466

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832193

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 J **4 Claims**



1. Solid-state relay, comprising a full-wave rectifier bridge having a first and a second d-c terminal, a thyristor having the anode thereof connected to said first terminal and the cathode thereof connected to said second terminal, a first transistor having a load circuit and a control terminal, the load circuit of said first transistor being connected to the gate and the cathode of the thyristor, a second transistor having means for supplying a control current thereto and having a load circuit, a Zener diode, a resistor, and a current amplifier having an input and two input terminals, one input terminal being connected through said Zener diode to the control terminal of said first transistor and through said resistor to said first terminal, and the other input terminal being connected to the first terminal, said current amplifier having an output and two output terminals, one output terminal being connected to said first terminal, and the other output terminal being connected through the load circuit of said second transistor to the gate of the thyristor.

4,324,990

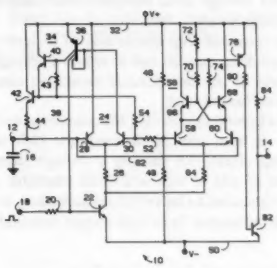
COMPARISON CIRCUIT ADAPTABLE FOR UTILIZATION IN A TELEVISION RECEIVER OR THE LIKE

Michael J. Gay, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,346

Int. Cl.³ H03K *5/153*

U.S. Cl. 307—350 **8 Claims**



1. A comparison circuit comprising a trigger stage having an input and output, the input of said trigger stage being adapted to receive an input signal, and a feedback circuit interposed between said output and said input of said trigger stage; said trigger stage being rendered active in response to a gating pulse applied thereto such that said trigger stage being caused to switch from a first state to a second state when activated if the magnitude of said input signal is below a first threshold level wherein the magnitude of said input signal is increased to a second threshold level by said feedback circuit; and a pulse generating circuit coupled to said trigger stage having an output coupled to an output of the comparison circuit to produce an output pulse thereat when said trigger stage is in said second state and the magnitude of the input signal traverses a third threshold level, said third threshold level having a value between said first and second threshold levels.

4,324,991

VOLTAGE SELECTOR CIRCUIT

Nobuo Tamaki, Murayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,773

Int. Cl.³ H03K *19/003, 19/094, 17/30, 17/693*

U.S. Cl. 307—443 **4 Claims**

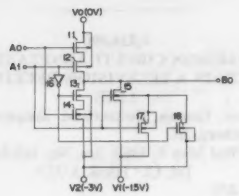
1. A voltage selector circuit comprising:

a first switching circuit (11, 12) including at least one MOS transistor having a source, drain, gate and substrate and adapted to be operated in ON-OFF fashion by a control signal inputted to the gate thereof, a voltage (V_0) of a first voltage level being inputted to the source of said at least one MOS transistor of said first switching circuit;

a second switching circuit (13, 14) including at least one MOS transistor having a source, drain, gate and substrate

and adapted to be operated in ON-OFF fashion by a control signal inputted to the gate thereof, a voltage (V_2) of a second voltage level different from said first voltage level being inputted to the source of said at least one MOS transistor of said second switching circuit;

a third switching circuit (**15**) including at least one MOS transistor (**15**) having a source, drain, gate and substrate and adapted to be operated in ON-OFF fashion by a control signal inputted to the gate thereof, a voltage (V_1) of a third voltage level being inputted to the source of said at least one MOS transistor of said third switching circuit,



said third voltage level being between said first and second voltage levels;

an output terminal (B_0) connected to at least said first to third switching circuits and to which a voltage inputted to the source of an On-operated switching circuit is delivered as an output; and

a fourth switching circuit (**17, 18**) connected to the substrate of said at least one MOS transistor (**15**) of said third switching circuit for causing a voltage supplied to said substrate of said at least one MOS transistor of said third switching circuit to be switched according to the voltage which is outputted from said output terminal (B_0).

4,324,992

ELECTROMAGNETIC MOTOR

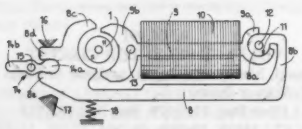
Daniel Paratte, Neuchatel, Switzerland, assignor to Fabrique d'Horlogerie de Fontainemelon, Neuchatel, Switzerland

Filed May 1, 1980, Ser. No. 145,680

Claims priority, application Switzerland, May 11, 1979, 4400/79

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **5 Claims**



1. An electromagnetic stepping motor, comprising a stepping rotor, and a stator which is made of at least two pieces assembled each to the other, one of said pieces presenting a protrusion of a general cylindrical shape and the other of said pieces presenting a recess of a shape corresponding to that of said protrusion, with said protrusion being engaged in said recess to maintain the assembly of said pieces, the two pieces being dimensioned to provide for rotation of the two pieces around the central axis of the protrusion.

4,324,993

COOLING MEDIUM BAFFLING DEVICE IN ROTARY ELECTRIC MACHINE

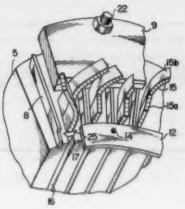
Masaki Sato; Hironori Okuda; Motoya Ito, and Yuji Makino, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,157

Claims priority, application Japan, Nov. 5, 1976, 51/132855

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—58 **4 Claims**



1. In a rotary electric machine including a stator core and a stator winding received in slots of said stator core, a cooling medium baffling device comprising a cooling medium baffle plate fixed to the inner peripheral edge of one end of said stator core by mounting means protruding axially from the end of said stator core, said mounting means being located only at circumferential positions other than positions defining a boundary between the different modes of phase currents flowing through the coils constituting said stator winding.

4,324,994

DRIVE UNIT WITH A MOTOR

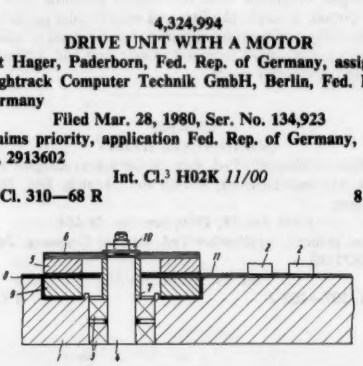
Horst Hager, Paderborn, Fed. Rep. of Germany, assignor to Hightrack Computer Technik GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 134,923

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913602

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 R **8 Claims**

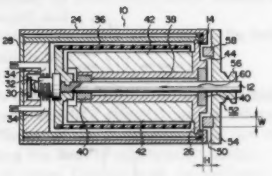


1. A direct-current motor unit, comprising a direct current motor including a stationary armature winding and a ring-shaped multipolar permanent magnet rotatable relative to said stationary winding so that a magnetic field extends through the latter; a plurality of elements arranged to electrically cooperate with said motor and spaced from the latter; a plurality of conductors connecting said elements to said electric motor; and a stationary plate member on which said armature winding and said connecting conductors are arranged and together formed as a common printed circuit, said stationary plate member having a first portion which is located substantially in the region of said magnet and on which said armature winding is arranged, and a second portion which extends outwardly of the region of said magnet and on which said connecting conductors are arranged.

4,324,995
THRUST PREVENTIVE DEVICE FOR THE OUTPUT SHAFT OF AN ELECTRIC MOTOR

Noboru Sakai, Tachikawa, and Tokuo Shimizu, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1980, Ser. No. 127,249
Claims priority, application Japan, Mar. 12, 1979, 54-31417[U]
Int. Cl.³ H02K 21/22
U.S. Cl. 310—153 8 Claims



1. A thrust preventive device for the output shaft of an electric motor, comprising:

an electric motor having an end face on one end thereof from which an elongated rotatable output shaft of the motor is projecting;

a recess provided on said end face of the motor;

a rotating force transmitting member secured to a portion of the output shaft which is projected from said end face of the motor, said rotating force transmitting member being outside the motor and having one end face opposing said end face of the motor, said rotating force transmitting member including a fly-wheel portion and a rotating force transmitting portion directly coupled to the fly-wheel portion for transmitting the rotating force of the output shaft, said one end face of said rotating force transmitting member being on said fly-wheel portion;

a projection of magnetizable material provided on said one end face of said rotating force transmitting member and projecting into said recess so as to bias said rotating force transmitting member when magnetized, jointly with the output shaft, by magnetic lines of force produced by the electric motor in one direction along the axis of said output shaft; and

a position maintaining means located inside an other end of said motor for preventing said output shaft from biasing said rotating force transmitting member, thus keeping said output shaft at a predetermined position.

4,324,996
INTERIOR ROTOR FOR AN ELECTRIC MACHINE

Hans-Joachim Adelski, Salz, and Wolfgang Volkrodt, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

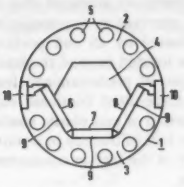
Filed Jul. 9, 1980, Ser. No. 167,118
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2928011
Int. Cl.³ H02K 21/12
U.S. Cl. 310—156 7 Claims

1. A bipolar permanent field interior rotor for an electric machine, comprising in combination:

(a) a shaft having an axis of rotation and at least one multi-sided section;

(b) a sheet metal disk for forming magnetic poles of said rotor, said disk having central edges and at least two segments and being disposed on said multi-sided section of said shaft; and

(c) a number of permanent magnet slabs each having an axis of magnetization, said number being less than the number of shaft sides, said magnet slabs being inserted between a number of central edges of said disk and said shaft such that said magnet slabs directly abut respectively a number of shaft sides and said central edges directly abut said magnet slabs and the remainder of said shaft sides,

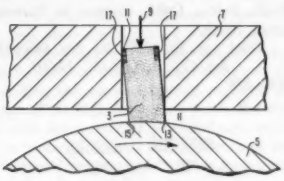


whereby said axes of magnetization are arranged radially with respect to said axis of rotation.

4,324,997
DAMPENED BRUSH SYSTEM

Owen S. Taylor, Penn Township, Westmoreland County, and Czeslaw A. Broniarek, Penn of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 8, 1980, Ser. No. 119,690
Int. Cl.³ H02K 13/00
U.S. Cl. 310—248 2 Claims

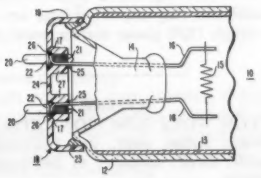


1. A monolithic brush for a dynamoelectric machine having an elastomer insert on the edge of the brush diagonally opposite the leading edge of the contact surface and extending along the side of the brush containing the trailing edge of the contact surface, the length of the insert extending along the side of the brush containing the trailing edge of the contact surface being substantially greater than the thickness of the insert.

4,324,998
BASE AND TERMINAL-PIN ASSEMBLY FOR AN ELECTRIC LAMP

John F. Gilmore, Verona, and Stanley A. Lopenski, Pompton Plains, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1980, Ser. No. 136,648
Int. Cl.³ H01J 5/48, 5/50
U.S. Cl. 313—318 10 Claims



1. In an electric lamp having a vitreous envelope with an end portion that has a protruding lead-in conductor and is secured to a base structure, the improvement comprising the combination of;

an insulator component of plastic resin material that constitutes an end wall portion of the base structure and has an aperture therein, said lead-in conductor being of such length and being so arranged that it extends into and through the aperture in the plastic insulator component and is terminated by an end portion of predetermined length that is located beyond the insulator aperture,

a rigid metal pin of predetermined length having an end segment in force-fitted frictional engagement with the apertured portion of said plastic insulator component and mechanically locked thereby in positive electrical contact with the part of the lead-in conductor that is disposed in said aperture,

the terminating end portion of said lead-in conductor being wrapped around a medial part of said metal pin and pressed against the outer face of the plastic insulator component by a laterally protruding portion of said pin which is located on the said medial part thereof,

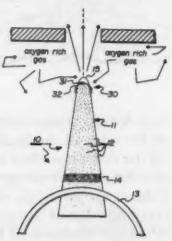
the free end segment of said pin extending outwardly from the base structure and plastic insulator component a distance such that the pin constitutes an exposed elongated terminal of controlled size and configuration for the electric lamp.

4,324,999

ELECTRON-BEAM CATHODE HAVING A UNIFORM EMISSION PATTERN

John E. Wolfe, Julian, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 30, 1980, Ser. No. 145,043
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 **9 Claims**



1. A method of making an electron-beam cathode which emits electrons in a cone-shaped pattern whose electron density is substantially uniform throughout the cone; said method including the steps of:

providing a needle-shaped piece of single crystal tungsten having dopant atoms of zirconium and oxygen in the bulk thereof, and having a plurality of concentric ring-shaped (100) surfaces on the needle's tip; and

heating said needle in an atmosphere of oxygen to diffuse atoms from said ring-shaped surfaces toward the needle's base until said ring-shaped surfaces are eliminated and only a single (100) planar surface exists on said needle's tip.

4,325,000

LOW WORK FUNCTION CATHODE

John E. Wolfe, Julian, Calif., and Lynwood W. Swanson, McMinnville, Oreg., assignors to Burroughs Corporation, Detroit, Mich.

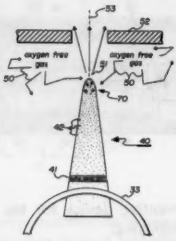
Filed Apr. 20, 1980, Ser. No. 145,042
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 **9 Claims**

1. A method of making an electron-beam cathode having a tip which emits electrons with a low work function over a relatively wide range of temperature and pressure in an oxygen free atmosphere; said method including the steps of:

attaching zirconium in multiple atomic layers to a portion of the surface of single crystal tungsten; and

heating said single crystal tungsten with said zirconium attached thereto in an oxygen rich atmosphere to diffuse said zirconium and said oxygen into the bulk of said tungsten;

said bulk of said tungsten with said zirconium and said oxygen diffused therein forming said low work function cathode, which operates by dispensing a single atomic layer of said zirconium and oxygen from said bulk to said tip when heated in said oxygen free atmosphere.



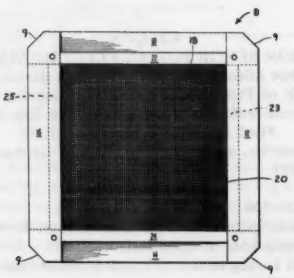
7. An electron-beam cathode which emits electrons with a low work function over a relatively wide range of temperature and pressure; said cathode being comprised of single crystal tungsten with zirconium and oxygen dopant atoms within the bulk of said tungsten; said single crystal tungsten also including a tip to which a single atomic layer of said zirconium and oxygen dopant atoms diffuse from said bulk when said cathode is heated in oxygen free atmosphere.

4,325,001

INORGANIC SPARK CHAMBER FRAME AND METHOD OF MAKING THE SAME

Thomas M. Heslin, New Carrollton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 7, 1980, Ser. No. 128,229
Int. Cl.³ H01J *1/46, 17/04, 19/38, 19/40*
U.S. Cl. 313—348 **20 Claims**



1. A method of manufacturing spark chamber frames, comprising the steps of:

forming a plurality of beams from inorganic material;

applying an inorganic bonding material to each end of said beams, said inorganic bonding material having substantially the same thermal expansion as said beam material;

forming said beams in a jig so that said ends of adjacent beams overlap;

firing said beams and said jig to bond said overlapping ends of said beams;

wrapping a wire between opposed beams, said wires being formed from an inorganic composition and uniformly spaced forming a grid;

covering said wires on said beams with an inorganic bonding material, said inorganic bonding material being substantially chemically and thermally compatible with said beam material;

covering said inorganic bonding material and said wires with a plurality of hold-down straps formed from inorganic material; and

firing said hold-down straps and said jig for bonding said wires to said beams.

8. A spark chamber frame, comprising:

a plurality of beams formed of inorganic material;

a first inorganic bonding material having substantially the same coefficient of thermal expansion as said beam material coupling the ends of said beams together;

a plurality of wires formed from an inorganic alloy and coupled between opposed beams, said wires being uniformly spaced and forming a grid;

a plurality of hold-down straps formed of inorganic material and having substantially the same chemical and thermal properties as said beam material, said hold-down straps overlying said wires and said beams; and

a second inorganic bonding material joining said hold-down straps, said wires and said beams.

4,325,002

LUMINESCENT SCREEN FOR FLAT IMAGE DISPLAY DEVICES

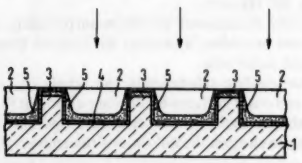
Manfred Kobale, Faistenhaar; Hans P. Lorenz, Schwarzenbruck; Kaspar Weingand, Gmund, and Rolf Wengert, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,541

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855142

Int. Cl.³ H01J *61/35, 29/30*

U.S. Cl. 313—485 **8 Claims**



1. In a luminescent screen for flat image display devices having a glass screen plate with a pattern of luminescent points thereon with the surfaces of such luminescent points being separated from one another by a contrasting border layer, the improvement comprising wherein:

said glass screen plate is provided with a pattern of recesses on an inner surface thereof corresponding to said pattern of luminescent points;

a luminescent material layer is positioned in each of said recesses along the bottom thereof as well as on the upwardly extending walls thereof; and

a contrasting border layer is positioned on land areas between each of said recesses, said border layer at a surface layer thereof adjacent said glass surface plate being substantially pure dielectric material and at an outermost surface thereof being substantially pure metal, with a gradually increasing amount of metal between such surfaces.

4,325,003

MAGNETRON

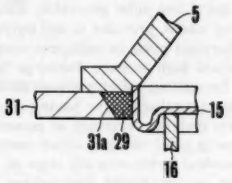
Suinchi Hatayama, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,695

Claims priority, application Japan, May 11, 1979, 54-62044[U]

Int. Cl.³ H01J *25/50*

U.S. Cl. 315—39.51 **4 Claims**



1. In a magnetron comprising an anode having a plurality of vanes provided radially around a cathode, a magnetic pole piece provided at an output terminal portion of the anode to guide flux of a permanent magnet to the center of the anode, whereby high frequency wave is generated in an interaction space between the anode and the vanes, metal means for vacuum sealing arranged in alignment with the center of the magnetic pole piece, a yoke being contiguous to the end surface of the magnetic pole piece and having a central hole which faces the outer circumference of the vacuum sealing metal means to form a magnetic path of the permanent magnet, and a metal gasket surrounding the vacuum sealing metal means for preventing leakage of the high frequency wave, the improvement wherein said yoke has a retainer provided on a portion of said yoke which is in contact with said gasket, and the retainer, magnetic pole piece and vacuum sealing means substantially wrap said gasket to constrain movement in the axial direction thereby, preventing said gasket from falling off.

4,325,004

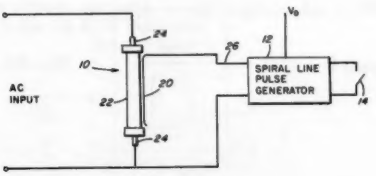
METHOD AND APPARATUS FOR STARTING HIGH INTENSITY DISCHARGE LAMPS

Joseph M. Proud, Wellesley; Leslie A. Riseberg, Sudbury, and Charles N. Fallier, Jr., Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 2, 1980, Ser. No. 193,787

Int. Cl.³ H01J *7/44, 17/34, 29/96;* **H01K** *1/62*

U.S. Cl. 315—45 **19 Claims**



1. A light source comprising:

a high pressure discharge lamp including a discharge tube having electrodes sealed therein at opposite ends for receiving operating power and enclosing a fill material which emits light during discharge;

pulse generating means including

a spiral line pulse generator including two conductors and two insulators, each in the form of an elongated sheet, in an alternating and overlapping arrangement which is rolled together in a spiral configuration having a plurality of turns, said spiral line pulse generator further

including an output taken between an innermost turn and an outermost turn of said spiral configuration and

means for switching said conductors from a first predetermined low voltage therebetween to a second predetermined low voltage therebetween in a time interval which is much shorter than the transit time of electromagnetic waves between said innermost turn and said outermost turn of said spiral line pulse generator; and

means for coupling the output of said spiral line pulse generator to said discharge lamp,

whereby said spiral line pulse generator, after operation of said switching means, provides at said output a high voltage, short duration pulse of sufficient energy to initiate discharge in said high pressure discharge lamp.

15. A method for starting a high pressure discharge lamp of the type including a discharge tube having electrodes sealed therein at opposite ends for receiving ac power from a lamp ballast and enclosing a fill material which emits light during discharge, said method comprising the steps of:

applying a first predetermined low voltage between two conductors of a spiral line pulse generator including said two conductors and two insulators, each in the form of an elongated sheet, in an alternating and overlapping arrangement which is rolled together in a spiral configuration having a plurality of turns, said spiral line pulse generator further including an output taken between an innermost turn and an outermost turn of said spiral configuration;

switching said conductors from said first low voltage therebetween to a second predetermined low voltage therebetween in a time interval which is much shorter than the transit time of electromagnetic waves between said innermost turn and said outermost turn of said spiral line pulse generator; and

coupling to said discharge lamp a high voltage, short duration pulse appearing at said output of said spiral line pulse generator after said step of switching said spiral line pulse generator,

whereby said high voltage pulse initiates discharge in said high pressure discharge lamp.

4,325,005

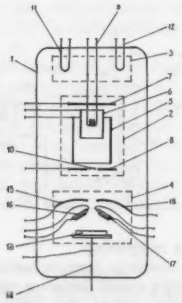
ION ACCELERATOR AND A METHOD FOR INCREASING ITS EFFICIENCY

Emil A. Ab, 1Emil Ab, 16/3 Ramot, Jerusalem, Israel

Filed Jul. 16, 1979, Ser. No. 57,894

Int. Cl.³ H01J *27/02*

U.S. Cl. 315—111.81 **25 Claims**



1. An ion accelerator comprising the following units enclosed in a common casing:

an ion source;

an arrangement of regulation of gas composition and pressure control

in a space closed by the ion accelerator casing;

a target unit;

wherein the said ion source contains

a main and an additional anode;

three cathodes one of which is a hot cathode;

wherein the said arrangement for regulation of gas composition and pressure control contains

a getter evaporation pump and a getter storage for ionized gas; and, wherein the said target unit contains

a target fastened on a holder;

an antidynatron electrode and an arrangement for target renovation.

4,325,006

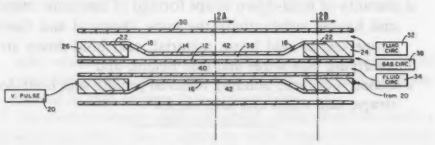
HIGH PULSE REPETITION RATE COAXIAL FLASHLAMP

Richard G. Morton, Richland, Wash., assignor to Jersey Nuclear-AVCO Isotopes, Inc., Bellevue, Wash.

Filed Aug. 1, 1979, Ser. No. 62,635

Int. Cl.³ H05B *41/34;* H01J *61/52*

U.S. Cl. 315—112 **9 Claims**



1. A flashlamp for pulsed operation at high repetition rates comprising:

a hollow, optically transparent outer tube;

a hollow, optically transparent central tube, coaxial with and within said outer tube and defining between said outer and central tubes a cylindrical discharge path having inner and outer surfaces coextensive with the inner and outer surfaces of said outer and central tubes;

a gas along said discharge path and capable of electrical energization to a light emitting condition;

means for energizing said gas to emit pulses of light at a rate above 200 Hz, and

an optically transparent envelope surrounding said outer tube and providing a conduit for coolant between itself and said outer tube.

means for cooling substantially the whole of at least said inner and outer surfaces by flowing a coolant through said central tube and between said envelope and outer tube thereby to shorten the fall time of the emitted light pulses.

4,325,007

HAZARD WARNING CIRCUIT

Hans Prohaska, Bietigheim-Bissingen, and Wolf Seitter, Marbach, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 5, 1980, Ser. No. 146,410

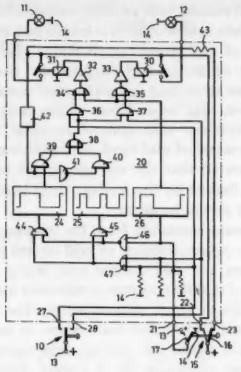
Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920602

Int. Cl.³ B60Q *1/52, 1/38*

U.S. Cl. 315—200 A **2 Claims**

1. A turn-signal flasher circuit for automotive vehicles wherein a turn-signal switch controls one of two turn-signal lamp circuits, and in which a hazard warning switch controls both lamp circuits simultaneously, comprising a pulse generator for controlling the frequency of the flashing light output of the lamps during the turn-signal operation of the flasher circuit, and a second pulse generator having a mark-to-space ratio which is substantially less than the mark-to-space ratio of the

first generator and responsive to the hazard warning switch for controlling the frequency of the simultaneous flashing of both



lamp circuits during the hazard warning operation of the flasher circuit.

4,325,008

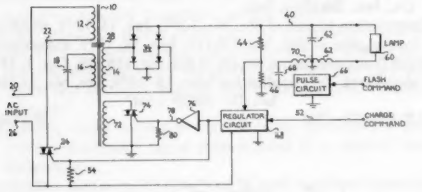
CLAMP ASSISTED CYCLE CONTROL REGULATING SYSTEM

Walter G. Borland, and Robert F. Brehse, both of Fort Wayne, Ind., assignors to General Electric Company, Salem, Va.

Filed Jun. 9, 1980, Ser. No. 157,629

Int. Cl.³ H05B *41/34*

U.S. Cl. 315—241 R **5 Claims**



1. In a regulated power supply circuit of the type for providing a predetermined magnitude of DC voltage across an output capacitor from a primary AC power source including a power transformer having a primary winding interruptably connected to the AC source by a gated triac, a first secondary winding for producing an AC output voltage, rectifying means interconnecting the first secondary winding and the output capacitor for converting the AC output voltage to a DC voltage on the capacitor and regulating means connected for sensing the voltage on the capacitor and for interrupting the connection between the AC source and the transformer primary winding by terminating a gate signal to the triac when the capacitor voltage reaches a predetermined magnitude, the improvement comprising:

(a) a control winding wound on the power transformer, said control winding having a pair of output terminals;

(b) controllable switch means connected between said pair of control winding output terminals for selectively short-circuiting said control winding; and,

(c) means responsive to the termination of the gate signal to the triac for energizing said switch means whereby said control winding is short circuited and further enhancement of the voltage on the output capacitor is inhibited.

4,325,009

DEVICE FOR DISPLAYING AN ANALOG SIGNAL ON A DISPLAY SCREEN

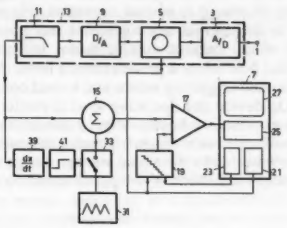
Henning H. Andersen, Albertlund, Denmark, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,895

Claims priority, application Netherlands, Jun. 6, 1979, 7904430

Int. Cl.³ H01J *29/52*

U.S. Cl. 315—386 **4 Claims**



1. A device for displaying an analog signal on the display screen of a cathode ray tube, comprising a line deflection generator and a frame deflection generator for scanning the display screen in a line raster pattern, a signal processing device which is arranged to form a processed signal by repeating the analog signal at the frequency of the line deflection generator, a reference voltage generator for generating a reference voltage whose value is dependent on the output voltage of the frame deflection generator, a comparator for comparing the processed signal with the reference voltage, the output voltage thereof being applied as a control signal to a beam intensity control device for the selective brightening of the scanned display screen, characterized in that the device comprises means **(31, 15)** for adding a periodically varying auxiliary signal to the processed signal, the frequency of said auxiliary signal amounting to at least ten times the frequency of the line deflection generator **(21)**.

4,325,010

BATTERY STATE OF CHARGE INDICATOR DEVICE

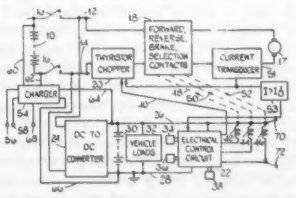
Michael W. Lowndes, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 146,900, May 5, 1980, which is a continuation of Ser. No. 918,539, Jun. 23, 1978, abandoned. This application Jul. 18, 1980, Ser. No. 171,937

Claims priority, application United Kingdom, Jul. 1, 1977, 27716/77; Apr. 12, 1978, 14288/78

Int. Cl.³ H02P *5/28*

U.S. Cl. 318—139 **5 Claims**



1. An electric vehicle including an electric storage battery; an electric traction motor mechanically connected to at least one ground wheel of the vehicle; motor current control means electrically connecting the motor to the battery, said control means including driver operable means and motor current sensing means and operating to control the supply of current to

the motor in accordance with the setting of the driver operable means; and a battery state-of-charge monitoring means comprising a battery voltage sensing circuit connected to the battery and providing an output signal representing the battery voltage, a signal storage device, a switch device connecting the output of the voltage sensing means to the signal storage device, said switch device having a control input at which a predetermined signal causes the output of the voltage sensing means to be applied to the signal storage device, a unidirectional current flow device in series with said switch device connected to prevent the signal stored on the signal storage device being increased in normal operation, triggering means connected to the current sensing means and operating when the output of the current sensing means indicates that the motor current falls below a predetermined level, timing means connected to said triggering means and to said control input of the switching device and operating so as to render the switching device conductive briefly after a predetermined delay following each operation of the triggering means, and indicating means connected to the signal storage device and providing a continuous indication of the signal stored on said storage device.

4,325,011

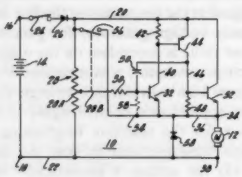
PULSE WIDTH MODULATION CONTROL CIRCUIT

Donovan F. Peterson, 655 Meadow La., Elm Grove, Wis. 53122

Filed Jan. 31, 1980, Ser. No. 117,257

Int. Cl.³ H02P 5/16

U.S. Cl. 318—345 B **33 Claims**



1. A control circuit providing pulse width modulated energization to a load from a d.c. power source comprising:

a pair of input terminals connectable to the d.c. source;

a pair of output terminals connectable to the load;

control means providing a control signal;

a first controllable semiconductor current conduction means having a pair of power terminals and a control terminal arranged in a first polarity configuration, said control terminal controlling the flow of current through said power terminals, one of said power terminals being connected through a first bias means to one of said input terminals, the other of said power terminals being connected to one of said output terminals, said control terminal being coupled to said control means;

a second controllable semiconductor current conduction means having a pair of power terminals and a control terminal arranged in a second polarity configuration complementary to said first configuration, said control terminal controlling the flow of current through said power terminals, one of said power terminals being connected to said one of said input terminals, the other of said power terminals being connected through a second bias means to said one of said output terminals, said second bias means providing a voltage responsive to the current through it, said control terminal being connected intermediate said first bias means and said one of said power terminals of said first controllable current conduction means for rendering said second current conduction means conductive when said first current conduction means is conductive;

a third controllable semiconductor current conduction means having a pair of power terminals and a control terminal arranged in said first polarity configuration, said control terminal controlling the flow of current through said power terminals, one of said power terminals being connected to said one of said input terminals, the other of said power terminals being connected to said one of said output terminals, said control terminal being connected intermediate said second bias means and said other power terminal of said second controllable current conduction means for rendering said third current conduction means conductive when said second current conduction means is conductive, said second bias means being connected in parallel between said control terminal and said other power terminal of said third controllable current conduction means so that the voltage across said second bias means is limited by the voltage drop across said control and other power terminal;

coupling means extending from the common connection of said other power terminal of said second current conduction means and said second bias means to the control terminal of said first current conduction means for providing a feedback signal determined by the limited voltage drop across said second bias means to said first current conduction means for driving said current conduction means into saturation for a period determined by the magnitude of the control signal; and

means connecting the other of said input and output terminals together.

4,325,012

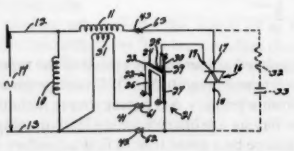
START WINDING CUT-OUT CIRCUIT FOR AN ELECTRIC MOTOR

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 3,357, Jan. 15, 1979, which is a continuation of Ser. No. 770,110, Feb. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 618,359, Oct. 1, 1975, abandoned. This application Mar. 15, 1979, Ser. No. 21,268

Int. Cl.³ H02P 1/44

U.S. Cl. 318—786 **39 Claims**



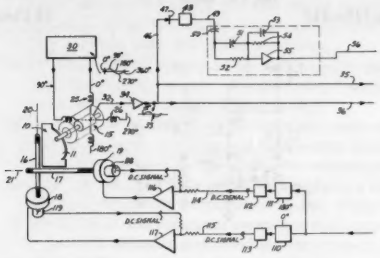
1. A start winding cut-out circuit for an AC electric motor including a stator, a main winding and a start winding, said main winding being adapted to be connected across AC power supply lines, said circuit comprising an electronic switch having a pair of power terminals and a gate which closes said switch in response to triggering current appearing thereon, said power terminals and said start winding being connected in series and connected across said main winding, timing means operating through a timing interval during current flow therethrough, said timing means being connected to said gate and forming a source of trigger current to said gate, and an auxiliary coil wound on said stator and adapted to have a voltage induced therein, said auxiliary coil being connected to provide said current flow through said timing means to provide said trigger current for said time interval after initial energization of said motor.

4,325,013

ELECTRICAL TRACER CONTROL SYSTEM UTILIZING SINE WAVE RESOLUTION

Robert H. Wenzel, 3426 E. Ruth Pl., Orange, Calif. 92667

Filed Mar. 28, 1980, Ser. No. 134,766
Int. Cl.³ G05B *19/33*
U.S. Cl. 318—578 **18 Claims**



1. A control for a profiling machine tool of the type which includes means mounting a cutting tool, and is adapted to cause relative motion between said cutting tool and a workpiece along at least two orthogonally-related axes so the said cutting tool can traverse a path relative to the workpiece which is geometrically similar to the contour of a template or pattern, motor means respective to each of said axes for causing relative motion along each respective axis, a sensing head of the type having a deflectible stylus and, coupled to said stylus, a pair of stylus position transducers each respective to one of said axes and adapted to produce a signal with a magnitude indicative of stylus defection in the respective axis, said control comprising:

a source of excitation voltage to excite each of said transducers with a sinusoidal voltage to produce a signal from both of said transducers, the excitation voltages applied to said transducers being 90° out of phase with one another;

means combining said signals from said transducers to provide a single sinusoidal transducer output signal;

voltage regulator means receiving said single signal and producing a regulated signal whose time of zero voltage crossing is in time phase with the same zero crossing of said single signal and having a constant and pre-determined sinusoidal voltage;

adjustable stylus deflection control means providing a direct current command signal proportional to a desired stylus deflection;

multiplier means multiplying one of said regulated signal and said single signal by said direct current command signal to produce a multiplied signal;

inverting means inverting one of said single signal, regulated signal or multiplied signal;

means receiving and combining said multiplied signal, and whichever of said regulated signal and single signal that was not multiplied by said direct current command to produce a sinusoidal error signal; and

resolution means receiving said error signal and producing motor control signals respective to stylus error on respective axes, which enable power to be supplied to drive respective motors in such directions as to reduce the error signal as the consequence of changing the relative position of the sensing head and template or pattern by operation of said motors.

4,325,014

AUTOMATIC CONTROL UNIT FOR A WIND-FOLLOWING ROTOR

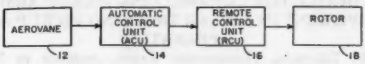
Richard K. Jeck, 23700 Eli La., Gaithersburg, Md. 20760

Filed Jan. 14, 1980, Ser. No. 111,592
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—614 **12 Claims**

1. Control apparatus for automatically controlling the angle and direction of rotation of the output shaft of a reversible motor as a function of a sensed fluid flow, said apparatus comprising:

means for receiving a flow direction signal responsive to the direction of said fluid flow, said signal representing a function of the angular displacement of said fluid flow from a pre-determined flow direction;

reference direction signal means for providing a direction reference signal representing a predetermined minimum angular displacement of said fluid flow from said predetermined flow direction;



directional threshold detection means responsive to said flow direction signal and direction reference signal for providing a control signal only when said flow direction signal is at least as large as said reference direction signal;

reversing means responsive to a predetermined rotation of said motor shaft relative to said predetermined direction for automatically reversing the rotation direction of said motor; and

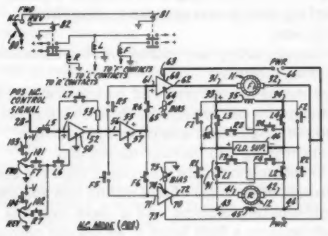
control means responsive to said control signal for actuating the motor.

4,325,015

DUAL MOTOR DRIVE FOR MACHINE TOOL

Francis E. Heiberger, Elmhurst, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed May 21, 1980, Ser. No. 151,899
Int. Cl.³ G05B *11/32*
U.S. Cl. 318—625 **6 Claims**



1. In a dual motor drive for a turntable of a machine tool capable of operating in a numerically controlled mode and a lathe mode, the combination comprising a circular rack on the turntable, a forward drive motor having a pinion, a reverse drive motor having a pinion, the pinions both being constantly coupled to the rack, a source of normal control signal variable in polarity and magnitude incident to operation in the numerically controlled mode, circuitry including amplifiers interposed between the source of normal control signal and the motors for drivingly energizing the motors alternatively depending upon the polarity of the normal control signal and at a speed which depends upon the magnitude of such signal, a source of auxiliary control signal of first polarity, means including a first set of auxiliary switches for reversing the direction of the reverse drive motor so that when the auxiliary signal of first polarity is applied both motors serve additively to drive the turntable in the forward direction in the lathe mode, a source of auxiliary control signal of second polarity, means including a second set of auxiliary switches for reversing the direction of the forward drive motor so that when the auxiliary signal of second polarity is applied both motors serve additively to drive the turntable in the reverse direction in the

lathe mode, manual selector means for (a) actuating the first set of switches while applying the auxiliary control signal of first polarity and for (b) actuating the second set of switches while applying the auxiliary control signal of second polarity, and means for disabling the normal control signal while one of the auxiliary control signals is being applied.

4,325,016

DEVICE FOR CONTROLLING PICKUP ARM MOVEMENT IN LINEAR TRACKING PICKUP ARM APPARATUS

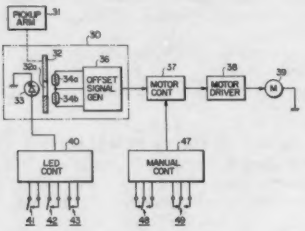
Atsushi Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 13, 1980, Ser. No. 159,383

Claims priority, application Japan, Jun. 15, 1979, 54-75397; Jun. 15, 1979, 54-75398; Jun. 21, 1979, 54-78369

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—640 **26 Claims**



1. A device for controlling movements of a pickup arm in a linear tracking pickup arm apparatus, comprising:

a pickup arm;

means for supporting said pickup arm for vertical and horizontal movements;

carriage means for carrying said pickup arm and said supporting means and being movable in direction perpendicular to the longitudinal axis of said pickup arm;

means for driving said carriage means; and

means of photo-electricity converting type for detecting a horizontal offset angle of said pickup arm and comprising a light-emitting element and a light-receiving element which receives a light beam of an amount corresponding to said offset angle,

the improvement comprising:

offset angle signal generating means connected to said offset angle detecting means for generating an offset angle signal of a value and a polarity corresponding to a magnitude and a direction of a detected offset angle of the pickup arm;

means for controlling the movement of said carriage means and being responsive to the offset angle signal to drive said carriage means to move said pickup arm so as to reduce said offset angle;

light-emitting element controlling means including means for detecting a position of said pickup arm for turning out a light-emission of said light-emitting element of said offset angle detecting means when the pickup arm is at one of its predetermined positions to thereby disable offset angle detecting means; and

manual controlling means including manually operable switch means for delivering to said carriage controlling means a carriage dirving signal in accordance with a manual operation of said switch means when said off-set angle detecting means is disabled.

4,325,017

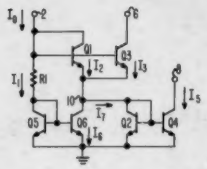
TEMPERATURE-CORRECTION NETWORK FOR EXTRAPOLATED BAND-GAP VOLTAGE REFERENCE CIRCUIT

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1980, Ser. No. 177,913

Int. Cl.³ G05F *1/58*

U.S. Cl. 323—313 **21 Claims**



1. A circuit for generating temperature dependent current for reducing the temperature dependence of a temperature dependent signal in an electrical circuit comprising:

resistance means having first and second ends for providing a resistance therebetween that exhibits a temperature coefficient;

semiconductor junction means having first and second ends for exhibiting a conduction potential responsive to current flow therethrough, which conduction potential exhibits a temperature coefficient of different value than that of said resistance;

means for maintaining related potentials across said resistance means and said semiconductor junction means;

current supplying means for supplying current to said resistance means and said semiconductor junction means so that the respective current through each is substantially equal to the difference between said supply current and the current in the other of said resistance means and said semiconductor junction means, whereby the current in each varies at a different rate with temperature;

means connected to one of said resistance means and said semiconductor junction means for receiving a substantial portion of the current therethrough and for developing said temperature dependent current in response to said substantial portion of the current; and

means for applying said temperature dependent current to said electrical circuit to effect said reduction.

4,325,018

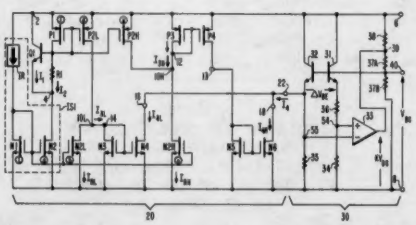
TEMPERATURE-CORRECTION NETWORK WITH MULTIPLE CORRECTIONS AS FOR EXTRAPOLATED BAND-GAP VOLTAGE REFERENCE CIRCUITS

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1980, Ser. No. 177,915

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—313 **29 Claims**



1. A circuit for generating a current responsive to the differ-

ence between a threshold temperature and a temperature removed therefrom comprising:

resistance means, having first and second ends, for providing a resistance therebetween that exhibits a temperature coefficient;

semiconductor junction means having first and second electrodes, said semiconductor junction means having a conduction potential that exhibits a temperature coefficient of value different than that of said resistance;

means connected to said resistance means and to said semiconductor junction means for maintaining the potentials thereacross in predetermined relationship;

means connected to the first electrode of said semiconductor junction means for applying a current thereto to condition said semiconductor junction means for conduction;

constant current generating means for supplying a reference current of magnitude proportional to that of the current flow in one of said resistance means and said semiconductor junction means at said threshold temperature; and

means for subtractively combining said reference current and a current responsive to the current flow in said one of said resistance means and said semiconductor junction means when said temperature departs from said threshold temperature in a predetermined direction to generate said current responsive to the difference between a threshold temperature and a temperature removed therefrom.

4,325,019

CURRENT STABILIZER

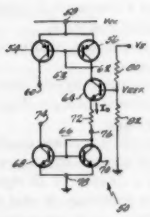
Hideharu Tezuka, Yokosukashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 19, 1980, Ser. No. 188,661

Claims priority, application Japan, Oct. 3, 1979, 54-127792

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—315 **4 Claims**



1. A current stabilizing circuit comprising:

a current source including first and second terminals, the current flowing through said first terminal controlling the current that may flow through said second terminal;

a transistor circuit including a resistor and a transistor having a base and current conducting terminals, said resistor being connected in series with said current conducting terminals, said transistor circuit being connected to said first terminal; and

means for controlling the current flowing through said base in relation to the temperature coefficients of said resistor and said transistor to cause the current that may flow through said second terminal to be constant and temperature independent.

4,325,020

REGULATING TRANSFORMER

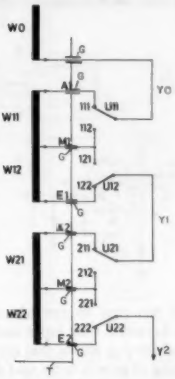
Franz Wein, Regensburg, Fed. Rep. of Germany, assignor to Machinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co KG, Regensburg, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 181,020

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2936650

Int. Cl.³ H01F *29/02*

U.S. Cl. 323—340 **1 Claim**



1. A regulating transformer comprising

(a) a base winding;

(b) a plurality of aligned auxiliary windings adapted to be serially connected in whole or in part to said base winding;

(c) each of said auxiliary windings having two ends and a tap between said two ends;

(d) a plurality of pairs of aligned change-over switches, the number of said pairs of change-over switches being equal to the number of said auxiliary windings;

(e) each pair of change-over switches including a first and a second fixed contact and a first movable contact adapted to engage selectively said first and said second fixed contact, and each pair of change-over switches further including a third and a fourth fixed contact and a second movable contact adapted to engage selectively each of said third and fourth fixed contacts;

(f) said first fixed contact of each pair of change-over switches being conductively connected to one end of one of said auxiliary windings, said second and said third fixed contacts of each of said pair of change-over switches being conductively connected to said tap of one of said auxiliary windings, and said fourth fixed contact of each pair of said change-over switches being conductively connected to the other end of one of said auxiliary windings;

(g) a point of said base winding being conductively connected to said first movable contact in the line of said pairs of change-over switches; and

(h) conductive connections interconnecting the movable contacts of said change-over switches according to their alignment.

4,325,021

REGULATED SWITCHING APPARATUS

John B. McMackin, Essington, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 190,987

Int. Cl.³ G05F *1/56*

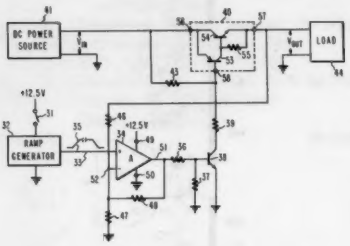
U.S. Cl. 323—351 **3 Claims**

1. An apparatus for providing linear switching of DC power

from a source to a load in which the switching transitions have linearly regulated rise and fall times responsive to an input control signal, said apparatus comprising:

a symmetrical ramp generator responsive to said control signal in one state for generating a rising ramp signal and in another state of said control signal for generating a falling ramp signal;

switch means including input and output terminals for coupling said source and said load, respectively, and having a switch control terminal, said switch means providing DC power from said source to said load according to the signal level at said switch control terminal, said switch



means being of the type to provide essentially constant potential drop between said input and output terminals when said signal level is above that certain threshold that provides coupling of power from said source to said load;

controllable limiter means including first and second limiter control terminals, said first limiter control terminal responsive to said ramp signal for providing a ramp control signal to said switch control terminal for thereby controlling the DC power from said source to said load; and

means coupled between the output terminal of said switch means and said second limiter control terminal for limiting the slope of said ramp control signal to always linearly regulate the rise and fall times of said power to said load.

4,325,022

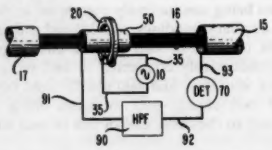
CABLE SHIELD FAULT LOCATION USING A CAPACITIVE-INDUCTIVE COUPLER

James A. Pelletier, Dover, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1979, Ser. No. 104,158

Int. Cl.³ G01R *31/11*

U.S. Cl. 324—52 **3 Claims**



1. Apparatus for detecting an open shield or bond along a cable route from a test location wherein each cable comprising the route has a multiplicity of wires surrounded by a conductive sheath, the shield formed by bonding the individual sheaths of juxtaposed cables, said apparatus

CHARACTERIZED BY

a capacitive coupler adapted for encompassing a plurality of said wires at said test location while maintaining the electrical and mechanical integrity of said wires,

a detector, connected between said coupler and said shield, for sensing signals propagated along a transmission line having said plurality as one conductor and said shield as the other conductor of said line,

said plurality, said coupler, said detector and the input impedance of said transmission line forming a series electrical path,

a high-frequency, time-limited source, and

a drive transformer, collocated with said coupler, comprising a split core for encircling said plurality and thereby magnetically coupling to said path, and a drive winding connected to said source,

wherein said detector provides an indication of the relative time displacement between the signal coupled to said line by said source and the return signal propagated along said line by reflection from said open.

4,325,023

DEVICE FOR INSPECTING AN INDIVIDUAL HIGH FREQUENCY SIGNAL SELECTED ACCORDING TO FREQUENCY FROM A BROAD FREQUENCY BAND

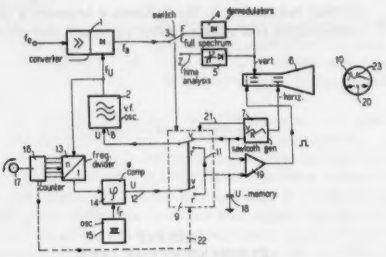
Kurt Zirwick, Greifenberg, Fed. Rep. of Germany, assignor to Rohde & Schwarz GmbH & Co KG, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,895

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914143

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **10 Claims**



1. A device for inspecting an individual high frequency signal selected according to frequency from a broad frequency band, comprising:

a cathode ray tube including a beam generating system, first and second beam deflection systems and a picture screen;

input means including a converter for converting input signals to different frequency positions;

demodulator means connecting said input means to said first beam deflection system;

a sweep generator connected to said second deflection system for generating a periodic sweep voltage including a leading edge and a trailing edge;

a local oscillator, including a phase controlled oscillator connected to and swept across a frequency range by said sweep generator to cause a display of all signals occurring in the frequency band in a spectrum on said picture screen;

an adjustable frequency mark generator connected to said oscillator f_{OL} generating a frequency mark voltage including a phase comparator, said frequency mark generator connected to said beam generating system to produce a mark which is adjustable on said picture screen to indicate a selected frequency;

storage means connected to said frequency mark generator; and

switching means connected between said sweep generator and said oscillator, and between said frequency mark generator and said oscillator and said storage means,

said switching means operable in a first mode to disconnect said sweep generator from said oscillator so that the instantaneous tuning voltage generated by said mark generator is stored in said storage means, and operable in a second mode to connect said sweep voltage to said local oscillator and to connect said storage means to said phase comparator to

compare the sweep voltage of the generator with the tuning stored voltage,

said switching means being maintained in the first mode during inspection of the selected frequency.

4,325,024

SYSTEM FOR MEASURING SIGNAL LEVELS

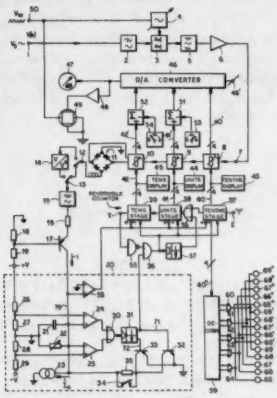
Karl-Heinz Heidenreich, Riederich, Fed. Rep. of Germany, and Helmut Wachtelborn, Parsippany, N.J., assignors to Wandel & Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,751

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928517

Int. Cl.[3] G01R *17/06, 15/10*

U.S. Cl. 324—99 D 15 Claims



1. A system for measuring the level of an incoming signal, comprising:

input means for receiving said incoming signal;

circuitry including digitally adjustable attenuation means connected to said input means for converting said incoming signal into a calibration current in an output circuit thereof;

reversible pulse-counting means connected to said attenuation means for adjusting same;

a source of constant reference current connected in bucking relationship with said attenuation means to said output circuit for producing a bipolar resulting current corresponding to the difference between said calibration and reference currents;

capacitive means connected to said output circuit for charging by said resulting current with a polarity depending upon the relative magnitudes of said calibration and reference currents;

threshold-sensing means connected to said capacitive means for unblocking a discharge path for said capacitive means upon the charge thereon attaining an absolute magnitude surpassing a predetermined limit, thereby generating a train of switching pulses with a recurrence period varying inversely with the absolute magnitude of said resulting current;

polarity-discriminating means connected across said capacitive means, said pulse-counting means being connected to said threshold-sensing means for stepping by said switching pulses in a direction determined by an output of said polarity-discriminating means with consequent adjustment of said attenuation means to reduce the difference between said calibration and reference currents to substantially zero; and

indicator means connected to said pulse-counting means for reading out the amount of attenuation required for substantial equalization of said calibration and reference currents.

4,325,025

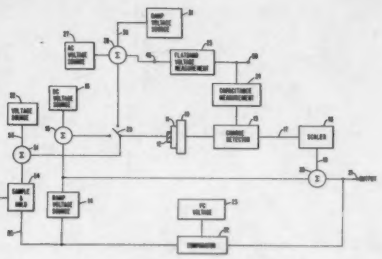
AUTOMATED CHANNEL DOPING MEASURING CIRCUIT

Richard A. Corcoran, Colchester; William A. Keenan, Montpelier; Demetrios Michaelides, South Burlington, all of Vt., and Bob H. Yun, Hopewell Jct., N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1980, Ser. No. 152,226

Int. Cl.[3] G01R *31/26, 27/26*

U.S. Cl. 324—158 R 7 Claims



1. An apparatus for measuring, in a metal insulator semiconductor structure, the surface potential and the impurity concentration in the semiconductor comprising;

means for measuring the flat band voltage of the structure,

means for measuring the capacitance of the insulator of the structure,

ramp voltage means for selectively biasing the semiconductor above the flat band voltage of the structure to deplete the semiconductor of mobile charges and effect a change in surface potential on the semiconductor,

integrator means coupled to the semiconductor for monitoring the impurity concentration in the semiconductor, and

summing means coupled to the output of the integrator means and to the ramp voltage of impurity concentration in the semiconductor into a measurement of the surface potential in the semiconductor.

4,325,026

PLURAL COIL EDDY CURRENT MAPPING PROBE

Frank W. Cooper, Jr., Monroeville, and Leonard R. Golick, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1979, Ser. No. 21,652

Int. Cl.[3] G01R *33/12;* G01N *27/90*

U.S. Cl. 324—232 9 Claims

1. An eddy current probe for mapping holes which extend into and at least partially through a magnetic material comprising:

a probe housing sized to be slidably inserted into the holes to be mapped in a direction parallel to a given axis of the probe;

a first eddy current coil affixed at one end of the probe having its axis of revolution parallel to the given axis of the probe;

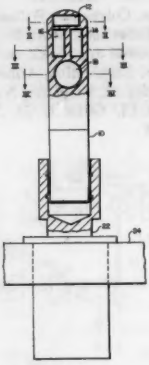
a second eddy current coil positioned on one side of and having its axis of revolution perpendicular to the given axis of the probe;

a third eddy current coil situated in juxtaposition to and along a common axis of revolution with the second eddy current coil on the opposite side of the given axis of the probe;

a fourth eddy current coil positioned on one side of and having its axis of revolution perpendicular to the given

axis of the probe and perpendicular to the axis of revolution of the second and third eddy current coils;

a fifth eddy current coil positioned in juxtaposition to and along a common axis of revolution with the fourth eddy current coil on the opposite side of the given axis of the probe;



means for communicating an alternating current to excite the respective coils; and

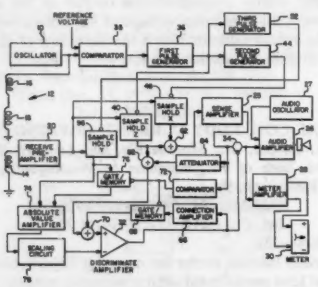
means for providing an electrical output representative of the relative impedance of the respective coils.

4,325,027

METAL DETECTOR FOR LOCATING OBJECTS WITH FULL SENSITIVITY IN THE PRESENCE OF DISTRIBUTED MINERAL MATERIAL

Donald W. Dykstra, and Samuel E. Calvin, both of Forest Grove, Oreg., assignors to Compass Electronics, Forest Grove, Oreg.

Filed Nov. 28, 1979, Ser. No. 98,233
Int. Cl.³ G01V *3/11, 3/165*
U.S. Cl. 324—329 **10 Claims**



1. A metal detector apparatus, comprising:

(a) a signal source circuit for producing a periodic transmit signal;

(b) a transmit coil, connected to said signal source circuit, for producing a changing magnetic field in response to said transmit signal;

(c) a receive coil, magnetically coupled to said transmit coil, for producing a receive signal in response to the proximity of material which distorts said magnetic field;

(d) first sampling means, synchronized with said transmit signal, for producing a first sample signal representative of the amplitude of said receive signal at a first predetermined phase relationship with said transmit signal;

(e) second sampling means, synchronized with said transmit signal, for producing a second sample signal representative of the amplitude of said receive signal at a second predetermined phase relationship with said transmit signal;

(f) discriminate amplifier means, having a first input connected to said first sampling means, and a second input connected to said second sampling means, and an output, for producing a discriminate signal representative of the proximity of a field-distorting material, said discriminate signal being proportional to the difference in amplitude between signals applied to said first and second inputs;

(g) feedback means, connected to said output of said discriminate amplifier means, for applying a correction signal to a selected input of said discriminate amplifier and thereby maintaining said discriminate signal at a predetermined amplitude; and

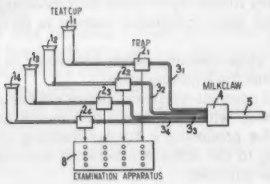
(h) interrupt means, connected to said feedback means and said selected input of said discriminate amplifier, and responsive to said receive signal, for fixing said correction signal in response to the proximity of a metallic material, such that said discriminate signal may vary in a predetermined relationship with the difference in amplitude between said first and second sample signals.

4,325,028

EXAMINATION APPARATUS FOR MILK DRAWN FROM QUARTER MAMMAE OF A MILK COW

Toshio Takahashi, Honjo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

PCT No. PCT/JP79/00187, § 371 Date Mar. 14, 1980, § 102(e) Date Mar. 5, 1980, PCT Pub. No. WO80/00274, PCT Pub. Date Feb. 21, 1980
PCT Filed Jul. 13, 1979, Ser. No. 191,213
Claims priority, application Japan, Jul. 14, 1978, 53-085951
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—442 **10 Claims**



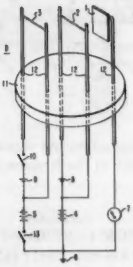
1. An examination apparatus for milk drawn from the quarter mamma of a cow, comprising a flow passage for the milk drawn from each quarter mamma, a trap provided in each said flow passage, electrodes provided in each said trap, an electric conductivity measuring circuit connected to said electrodes in each said trap for measuring the electric conductivity of the milk therein, a minimum value selecting circuit connected to said electric conductivity measuring circuit for selecting the minimum conductivity value measured, a subtracting circuit connected to said electric conductivity measuring circuit and the minimum value selecting circuit for outputting the difference in electric conductivity of the milk from at least two of the quarter mammae, comparator circuit means for comparing the output of said subtracting circuit with at least one predetermined reference value, grouping circuit means for grouping corresponding outputs of said comparator circuit means and an indication means responsive to the output of said grouping circuit means for indicating the extent of the quality of the milk.

4,325,029

ALKALI IONIZATION DETECTOR

John Hrizo, Monroeville; James E. Bauerle, Plum Borough, and Robert E. Witkowski, West Mifflin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1979, Ser. No. 73,827
Int. Cl.[3] G01N *27/62;* G01R *35/00*
U.S. Cl. 324—468 5 Claims



1. In an alkali metal ionization detector having a heated filament electrode for thermally ionizing alkali metal atoms or alkali metal-containing particles in a monitored gas environment to form positive ions, and a source of electrical potential connected to a collector electrode to attract the positive ions and establish an ion current flow which is indicative of the concentration of the alkali metal atoms or alkali metal-containing particles, the improvement for providing the in-situ calibration of the detector, the improvement comprising,

a calibration filament element including the alkali metal of interest, said element being positioned adjacent to said heated filament electrode, and

a calibration electrical excitation means connected to said calibration filament element to cause said calibration filament element to generate alkali metal atoms,

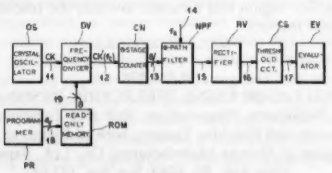
said heated filament electrode responding to said alkali metal atoms by producing positive ions by positive surface ionization, said positive ions being attracted to said collector electrode and establishing a calibration ion current flow in said detector.

4,325,030

FREQUENCY DISCRIMINATOR FOR SIGNAL RECEIVER OF TELECOMMUNICATION SYSTEM

Armando Colamonico, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Mar. 19, 1980, Ser. No. 131,704
Claims priority, application Italy, Mar. 20, 1979, 21129 A/79
Int. Cl.[3] H03K *5/00;* H03B *1/00;* H03L *7/00*
U.S. Cl. 328—140 5 Claims



1. A frequency discriminator for a signal receiver of a telecommunication system, comprising:

oscillator means for producing an original pulse sequence of stable clock frequency;

adjustable frequency-divider means connected to said oscillator means for generating a square wave of a reduced frequency related to said clock frequency by a variable step-down factor;

pulse-distributing means connected to said frequency-divider means for converting said square wave into a set of N relatively staggered pulse trains of a cadence equal to 1/N times said reduced frequency;

an N-path filter with driving inputs connected to said pulse-distributing means for energization by said pulse trains and with a data input connected to receive incoming signals;

detection means connected to said N-path filter for determining the reception of an incoming signal whose frequency substantially matches said cadence; and

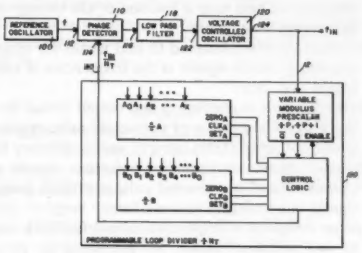
frequency-selecting means connected to a control input of said frequency-divider means for modifying said step-down factor according to a desired signal frequency to be recognized.

4,325,031

DIVIDER WITH DUAL MODULUS PRESCALER FOR PHASE LOCKED LOOP FREQUENCY SYNTHESIZER

William J. Ooms, Hazelcrest, and Richard E. Barnett, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1980, Ser. No. 121,207
Int. Cl.[3] H03K *21/36;* H03L *7/18*
U.S. Cl. 331—1 A 8 Claims



1. A high speed frequency divider, suitable for use in a phase locked loop, comprising:

dual modulus prescaler means, having an input and an output, for frequency dividing an input signal by one of two predetermined divisors P and P', and applying the divided signal to the output;

first means for frequency dividing the signal at the output of the prescaler means by the divisor A;

second means for frequency dividing the signal at the output of the prescaler means by the divisor B;

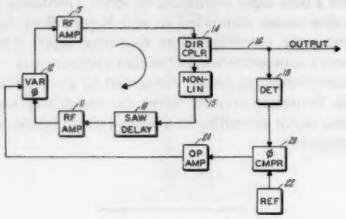
logic means for controlling the prescaler means and dividing means so that the signal at the output of the prescaler means is alternately frequency divided by A and B, and such that the first dividing means is reset while the division by B is occurring and the second dividing means is reset while the division by A is occurring, said logic means including means for actuating the prescaler means from its P' divisor to its P divisor upon transition from the A divisor to the B divisor and from its P divisor to its P' divisor upon transition from the B divisor to the A divisor, and including means for coupling to an output a divided signal having a transition for each actuation of the prescaler;

whereby the overall divide ratio N_T is given by $N_T = PB + P'A$.

4,325,032
PRF STABILIZED SURFACE ACOUSTIC WAVE OSCILLATOR

Meyer Gilden, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 11, 1980, Ser. No. 129,438
Int. Cl.³ H03L 7/08, 7/18
U.S. Cl. 331—25 3 Claims



1. A stabilized surface acoustic wave comb spectrum generator comprising:

an oscillatory loop having variable delay means including a surface acoustic wave delay line, said variable delay means having a control signal input thereto to adjust the phase of signals circulating in the oscillatory loop as a function of control signal applied thereto, amplification means to provide loop gain, a nonlinear means for permitting only pulsed RF signals in excess of a threshold magnitude to circulate through said loop, and means for coupling out of said loop a fraction of the energy of signals circulating in the loop;

an output circuit connected to said means for coupling for providing output signals at the frequencies of oscillations within said loop;

feedback means connected to said output circuit for providing a signal indication of the actual pulse repetition frequency of signals circulating in said oscillatory loop;

reference means for providing reference signals at a frequency related to a desired pulse repetition frequency of signals circulating in said oscillatory loop;

a phase comparator responsive to said feedback means and to said reference means for providing an error signal representative of the deviation of said actual pulse repetition frequency from said desired pulse repetition frequency, said error signal being connected to said control signal input of said variable delay means, thereby to stabilize the pulse repetition frequency of signals circulating in said oscillatory loop.

4,325,033
PNEUMATICALLY DITHERED LASER GYRO

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

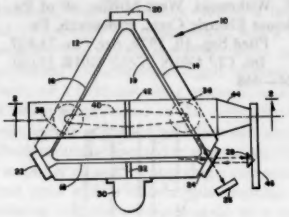
Filed Jul. 2, 1979, Ser. No. 54,331
Int. Cl.³ H01S 3/098
U.S. Cl. 372—94 10 Claims

1. A ring laser gyro, comprising

an envelope for an optical resonant cavity, wherein said envelope contains an active gas medium;

electrically energizable electrode means for establishing an electrical discharge in said active gas medium thereby exciting a pair of light beams counterpropagating in said optical resonant cavity, wherein said light beams tend to exhibit mode locking;

mechanical means for inducing an oscillatory flow of said active gas medium in said optical resonant cavity whereby mode locking effects are reduced; and

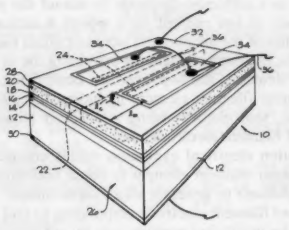


means for generating an output signal for said gyro by measuring a difference in the frequencies of said light beams.

4,325,034
SEMICONDUCTOR LASERS WITH INTEGRALLY FORMED LIGHT EMITTING DIODES

John C. Dyment, Kanata; Christopher M. Look, Nepean, and Kiu-Chi D. Chik, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1980, Ser. No. 121,172
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 5 Claims



1. A semiconductor device comprising a laser and a light emitting diode having a common pn junction, the laser and the light emitting diode having top and bottom contacts for directing current across the pn junction, to generate light at respective active regions thereof, the device having opposed planar reflecting facets defining a resonant cavity of the laser, the laser activity region extending to the opposed facets, the light emitting diode active region being spaced from the facets but located close to the laser resonant cavity whereby spontaneous emission generated at the light emitting diode active region and directed towards the facets is absorbed by the chip material and spontaneous emission generated at the light emitting diode active region and directed towards the resonant cavity penetrates thereto.

4,325,035
OSCILLATOR USING DIELECTRIC RESONATOR

Toshio Nishikawa, Nagaokakyo; Yoji Ito, Takatsuki; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 20, 1980, Ser. No. 123,061
Claims priority, application Japan, Mar. 1, 1979, 54/24751
Int. Cl.³ H03B 5/18
U.S. Cl. 331—96 30 Claims

1. An oscillator using a dielectric resonator, comprising:

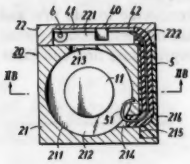
a casing made of an electrically conductive material and having a wall defining a space therein;

a dielectric resonator disposed within said space;

amplifying means disposed outside said wall and including an input circuit and an output circuit;

input coupling means associated with said input circuit for coupling said input circuit and said dielectric resonator through said wall; and

output coupling means associated with said output circuit

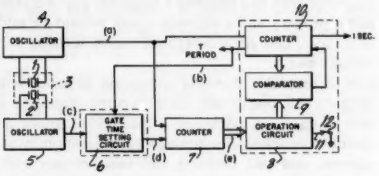


for coupling said output circuit and said dielectric resonator through said wall, said output coupling means comprising an output coupling window formed in said wall and positioned with respect to said output circuit at a location which permits propagation of a predetermined amount of an electromagnetic wave from said output circuit to said dielectric resonator.

4,325,036
TEMPERATURE COMPENSATING CIRCUIT

Tsuneo Kuwabara, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,606
Claims priority, application Japan, Jun. 1, 1979, 54/068247
Int. Cl.³ H03L *1/00*
U.S. Cl. 331—176 **1 Claim**

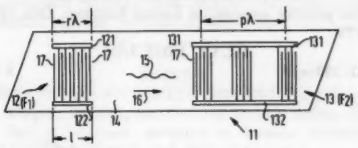


1. A temperature compensating circuit comprising: two piezo electric resonators having different frequency-temperature characteristics, a major resonator having smaller frequency variation rate in temperature variation and a subsidiary resonator having larger frequency variation rate in temperature variation; an oscillator for oscillating said two resonators independently; a gate time setting circuit for setting a gate time using one of outputs of said oscillator; a counter for counting the other output of the oscillator by a gate time set by the gate time setting circuit; an operation circuit for operating an oscillation frequency of the resonator using coefficients of each term of high degree polynominal approximately concluded when a counting value is a variable against an oscillating frequency of the major resonator; a counter for counting the oscillator output of the major resonator; and a comparator for comparing the counting value of the counter with the counting value of the operation circuit and for generating a reset signal when the counting values coincide with each other.

4,325,037
ACOUSTIC WAVE FILTER

Wolf E. Bulst, Vaterstetten, and Hans Eschler, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,814
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909705
Int. Cl.³ H03H *9/64, 9/25*
U.S. Cl. 333—194 **12 Claims**

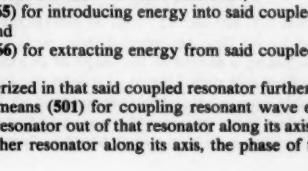


1. A piezoelectric substrate, a first interdigital structure **(12)** formed on a first surface of said substrate, having a mean frequency of f_1 and frequency band width of F_1, a second interdigital structure formed on a first surface of said substrate and longitudinally offset from said first interdigital structure and having a mean frequency of f_2 and a frequency band width F_2 which is narrower than the frequency band width of F_1 of said first interdigital structure, said mean frequency f_2 of said second interdigital structure offset by a frequency displacement Δf from the mean frequency of said first interdigital structure so that the amplitude characteristic F_2 of said second interdigital structure has a mean frequency f_2 which occurs at one half the distance from f_1 to a zero of the amplitude characteristic of F_1.

4,325,038
SAW RESONATOR FILTERS WITH IMPROVED TEMPERATURE STABILITY

Larry A. Coldren, Holmdel Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 26, 1980, Ser. No. 191,155
Int. Cl.³ H03H *9/25, 9/64, 9/145*
U.S. Cl. 333—195 **11 Claims**



1. A temperature stable coupled resonator which comprises:

a medium **(39)** on which surface waves propagate;

grating means **(61, 62, 63, 64)** disposed on said medium for forming first and second grating resonators for said surface waves; and

first means **(500)** for coupling resonant wave energy from each resonator into the other resonator;

means **(65)** for introducing energy into said coupled resonator; and

means **(66)** for extracting energy from said coupled resonator

characterized in that said coupled resonator further includes

second means **(501)** for coupling resonant wave energy in each resonator out of that resonator along its axis and into the other resonator along its axis, the phase of the wave

energy out of said second means being substantially in quadrature to the phase of the wave energy out of said first means.

4,325,039

LEAKY COAXIAL CABLE WHEREIN APERTURE SPACINGS DECREASE ALONG THE LENGTH OF THE CABLE

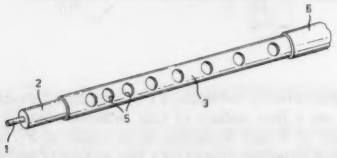
Brian H. Allebone, Chester, England, assignor to BICC Limited, London, England

Filed Oct. 28, 1980, Ser. No. 201,567

Claims priority, application United Kingdom, Oct. 31, 1979, 37616/79

Int. Cl.³ H01P *3/06*

U.S. Cl. 333—237 **8 Claims**



1. A high frequency coaxial cable comprising an inner conductor and, insulated from and surrounding the inner conductor throughout the length of the cable, an outer conductor of metal or metal alloy having extending longitudinally throughout at least a finite part of its length at least one row of apertures that are mutually spaced along the outer conductor, each aperture being of such a size and the mutual spacing between adjacent apertures being such that high frequency signals can be received by or transmitted from the cable, wherein the mutual spacing between adjacent apertures of said row decreases along the length of the row, being a maximum value at the end of the row and a minimum value at the other end of the row.

4,325,040

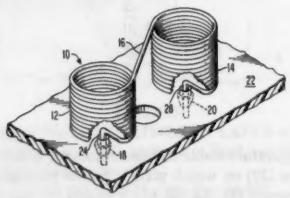
APPARATUS FOR AUTOMATIC ADJUSTMENT OF AN INDUCTOR IN A TUNED CIRCUIT

George J. Whitley, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,789

Int. Cl.³ H03J *3/00*

U.S. Cl. 334—17 **6 Claims**



1. In a tuned circuit of the type including an inductor mounted on a circuit board, wherein said inductor comprises a conductor having respective first and second ends connected to respective first and second points on said circuit board, said conductor having first, second and third portions, said first portion including a section in the shape of an extensible coil extending from said circuit board, said third portion including an extensible section extending from said circuit board, said second portion being connected between said first and second portions, and wherein said circuit board is formed with an opening therethrough located below said second portion, an apparatus for adjusting said inductor comprising:

first means extending through said opening in said circuit board for exerting mechanical force against said second portion of said inductor;

second means for exerting mechanical force against said second portion extending in a direction opposite to that of said first means; and

control means connected to said first and second means for controlling said first and second means to simultaneously extend or compress said first and third portions.

4,325,041

CIRCUIT INTERRUPTER

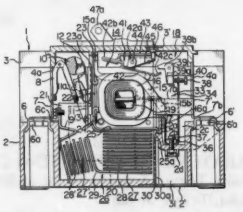
Wasaburo Murai, Osaka, Japan, assignor to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1980, Ser. No. 206,857

Claims priority, application Japan, Nov. 10, 1979, 54-144939

Int. Cl.³ H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—35 **3 Claims**



1. A circuit interrupter comprising in an insulating housing:

an electromagnetic means including a magnetic core, at least two separate magnetic yokes magnetically coupled to said magnetic core and defining a magnetic gap therebetween, and a primary and a secondary coil wound on said magnetic core, said electromagnetic means forming a current transformer;

a pair of separable contacts connected in series with said primary coil, one of said contacts being carried by a movable contact arm extending within said magnetic gap in a direction enabling electromagnetic separation by an overcurrent, and said contacts and said primary coil being connectable to an external circuit to be protected;

an operating mechanism for opening and closing said separable contacts;

a thermally responsive trip means including a bimetal element serially connected to said secondary coil of said electromagnetic means for actuating said operating mechanism to open said contacts upon the occurrence of an overcurrent;

an instantaneous trip means including a magnetic armature disposed in the vicinity of said electromagnetic means for magnetically actuating said operating mechanism to separate said contacts upon the occurrence of a short-circuit current;

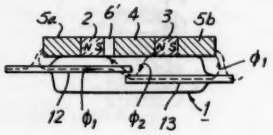
an arc extinguishing means disposed within said magnetic gap of said electromagnetic means for extinguishing an electric arc; and

means including portions of said magnetic yokes of said electromagnetic means for magnetically driving an electric arc established between separated contacts into said arc extinguishing means.

4,325,042
THERMO-MAGNETICALLY OPERATED SWITCHES HAVING TWO DIFFERENT OPERATING TEMPERATURES

Masanori Endo, Yokohama, and Kentaro Horiuchi, Sendai, both of Japan, assignors to Tohoku Metal Industries, Ltd., Sendai, Japan

Filed May 13, 1980, Ser. No. 149,321
Claims priority, application Japan, May 14, 1979, 54-57981
Int. Cl.³ H01H *36/00*
U.S. Cl. 335—208 **4 Claims**



1. A thermo-magnetically operated switch having two different and predetermined lower and higher operating points on a temperature scale so that it may be maintained open below the lower operating point and above the higher operating point and be maintained closed between the two different operating points, which comprises:

an elongated reed switch having an envelope and a pair of ferromagnetic reeds hermeticaly sealed in said envelope with free ends thereof overlapped for opening and closing movements relative to one another;

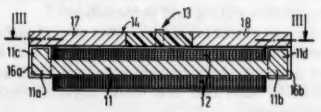
two first magnetic members formed of first ferromagnetic substances having a first Curie point corresponding to said higher operating point, said first magnetic members being disposed alongside, and at axial opposite ends of, said reed switch with an axial space therebetween;

two permanent magnets having a Curie point higher than an operating temperature range of the switch and disposed alongside said reed switch within said axial space between said first magnetic members and in contact with said first magnetic members respectively, so that a magnetic pole of one of said permanent magnets is opposite a different magnetic pole of the other permanent magnet with an axial space therebetween, respective permanent magnets being disposed over the respective reeds but spaced from the overlapped ends of the reeds; and at least one magnetic member of second ferromagnetic substance having a second Curie point corresponding to said lower operating point and disposed in said axial space between said permanent magnets with at least one axial magnetic gap.

4,325,043
POLARIZED MAGNET SYSTEM

Rolf-Dieter Kimpel, Unterschweinbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,961
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006948
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—229 **8 Claims**



1. A polarized magnet system comprising:

a coil having a ferromagnetic core having a longitudinal axis;

an elongated rotary armature having a permanent magnet means thereon, said rotary armature being disposed substantially parallel to said coil axis and approximately above a center of said coil, said armature having opposite ends each terminating in a pair of spaced tabs depending substantially perpendicular to said coil axis in the direction of said coil core;

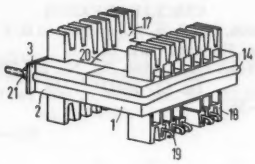
said coil having opposite ends respectively extending between and surrounded on opposite sides by respective pairs of said tabs to form a working air gap; and

said permanent magnet means extending to said ends of said armature legs and terminating therewith.

4,325,044
MOUNT FOR AN ELECTROMAGNETIC COIL

Roland Ehrgott, Munich, and Gerhard Meindl, Alling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,811
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 7909134[U]
Int. Cl.³ H01F *27/26*
U.S. Cl. 336—67 **8 Claims**



1. In an electromagnetic coil assembly consisting of opposed abutting E core halves each having an end face and each further having a centrally disposed leg and two outer legs, and a hollow coil bobbin carrying a winding which receives said central legs and is disposed between said halves, a mount for said assembly comprising:

a retainer which surrounds an end face of a first E core half and each of said outer legs and which terminates in two threaded ends;

a means in said legs for receiving and aligning said retainer;

a plate having a pair of spaced bores therein for receiving said ends of said retainer for applying equalized retaining pressure against the end face of a second E core half,

said plate further having a pair of longitudinal slots therein extending from each of said bores to an exterior edge of said plate, said slots forceably closeable for rigidly affixing said plate a fixed distance from said end face of said first E core half; and

a pair of bolts respectively received on said threaded ends to maintain said plate in pressure applying relation to said end face.

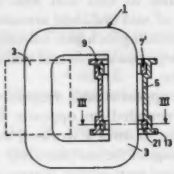
4,325,045
DEVICE FOR PROVIDING WINDINGS ON CLOSED RING CORES

Siegfried Mehl, Wetzlar-Hermannstein, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,222
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931362
Int. Cl.³ H01F *27/30*
U.S. Cl. 336—197 **11 Claims**

1. An induction device comprising, a closed ring magnetic core having at least one core leg, a guide member secured to said core leg and having guide paths on an exposed surface

thereof, a coil former rotatably arranged on said core leg in cooperative relationship with the guide paths on said guide member, a coil formed on said coil former by rotation of the



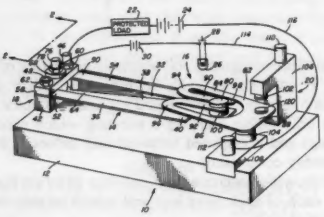
coil former in said guide paths, and means for securing the coil former in a fixed position subsequent to winding the coil thereon.

4,325,046

CIRCUIT BREAKER

Hadley K. Burch, Pittsfield, Vt., assignor to B/K Patent Development, Inc., Highland Park, Ill.

Filed Apr. 4, 1980, Ser. No. 137,399
Int. Cl.³ H01H *71/16*
U.S. Cl. 337—56 **5 Claims**



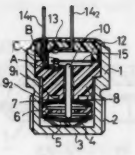
1. An ambient-compensated remotely-resettable circuit breaker comprising:
- a base,
- a metal strip member having first and second divergent legs, said legs being joined at an upper portion, said legs having lower portions spaced apart and fixed to said base,
- said upper portion being movable from a first to a second position in response to current in excess of a selected value through said first leg, and movable from the second back to the first position in response to current in excess of a selected second value through said second leg,
- a contact assembly having fixed, spaced apart first and second contacts for electrically contacting said upper portion, and first contact engaging the upper portion in its said first position and said second contact engaging the upper portion in its said second position,
- a first electrical connection electrically connected to said first leg, and
- a second electrical connection electrically connected to said second leg,
- said first electrical connection being connectable through an electrical load to said first contact, and
- said second electrical connection being connectable through a reset switch to said second contact.

4,325,047

TEMPERATURE RESPONSIVE SWITCH

Masami Inada, Kariya; Nobuyuki Hashimoto, and Atsushi Satomoto, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 27, 1981, Ser. No. 248,117
Claims priority, application Japan, Apr. 9, 1980, 55-47419; Apr. 9, 1980, 55-47420
Int. Cl.³ H01H *37/52*
U.S. Cl. 337—370 **16 Claims**



1. A temperature responsive switch comprising
- a hollow casing member which is open at its one end;
- a cover member which closes the opening;
- a guide member for dividing an internal space defined by the casing and the cover member into a first and a second internal space, the guide member being centally formed with a guide opening for an actuator;
- a first bimetal disc disposed in the first internal space;
- a second bimetal disc disposed in the first internal space and having an opening centrally formed therein to pass an actuator;
- a spacer interposed between the first and the second bimetal disc and having an opening formed therein to pass an actuator;
- spring means disposed in the first inner space for supporting the first bimetal disc;
- an actuator member extending through the guide opening and the openings formed in the second bimetal disc and the spacer;
- resilient switching arm disposed in the second internal space and extending to traverse the axis of the guide opening;
- and a plurality of electrical contact members disposed on the path of movement of the switching arm and spaced from each other.

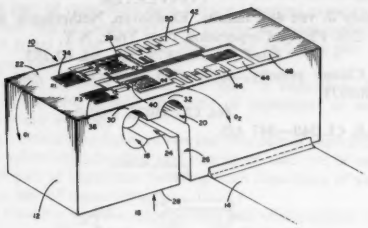
4,325,048

DEFORMABLE FLEXURE ELEMENT FOR STRAIN GAGE TRANSDUCER AND METHOD OF MANUFACTURE

Hooshmand Zaghi, Oxnard, and Thomas C. Tisone, Thousand Oaks, both of Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 29, 1980, Ser. No. 125,833
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—3 **18 Claims**

1. An improved deformable flexure element for use in a strain gage transducer, comprising:
- a deformable body having at least one flat surface, a first portion of said body beneath said surface being subjected to tension during deformation of said body and a second portion of said body beneath said surface being subjected to compression during said deformation;
- at least one pair of resistances deposited on said surface, with one resistance of the pair above each of said first and second portions, the arrangement of the body and resistances being such that heat flows asymmetrically from said resistances;
- said body and said resistances being made of materials such that



$$[TCR_f]\frac{d(\Delta T)}{dT} + \Delta TCR\frac{dT_2}{dT}$$

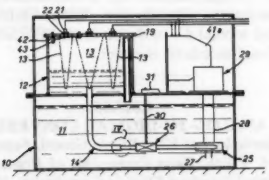
substantially equals zero, where TCR_f is the thermal resistance coefficient of the resistances; ΔT is the temperature gradient between the resistances on said first and second portions; T is the ambient temperature; ΔTCR is the gradient of the thermal resistance coefficient between the resistances on said first and second portion; and T_2 is the temperature of said second portion whereby thermal conditions of the transducer are effectively prevented from providing spurious strain indications.

4,325,049

ELECTRODE FOR A LIQUID RHEOSTAT, AND A LIQUID RHEOSTAT INCLUDING SUCH AN ELECTRODE

Michel Bensadoun, 13 Avenue de Limoges, 87270 Couzeix, France

Filed Sep. 10, 1979, Ser. No. 73,748
Claims priority, application France, Sep. 13, 1978, 78 26267
Int. Cl.³ H01C *10/02*
U.S. Cl. 338—86 **14 Claims**



1. An electrode for a liquid rheostat, said electrode comprising a plurality of generally annular elements, consecutive elements being electrically connected in series, and connecting bridge members arranged transversely of and connecting transversely adjacent like parts of said annular elements together.

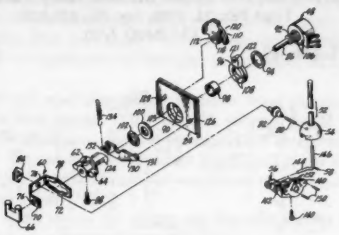
4,325,050

CONTROL STICK ASSEMBLY

Edward D. Suszynski, Vista, Calif., assignor to Kraft Systems, Inc., Vista, Calif.

Filed Dec. 8, 1980, Ser. No. 214,439
Int. Cl.³ H01C *10/16*
U.S. Cl. 338—128 **10 Claims**

1. A control stick assembly comprising:
a first potentiometer having a first rotatable input shaft;
a second potentiometer having a second rotatable input shaft;
a control stick;
a crank connecting the control stick to the first input shaft to rotate same responsive to movement of the control stick along one axis; and



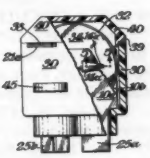
a bail connecting the control stick to the second input shaft to rotate same responsive to movement of the control stick along an axis transverse to the one axis.

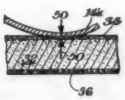
4,325,051

PTCR PACKAGE

George H. Rodriguez, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 29, 1980, Ser. No. 182,565
Int. Cl.³ H01C *13/00, 7/02*
U.S. Cl. 338—220 **10 Claims**



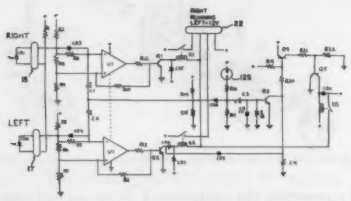


1. A positive temperature coefficient resistor (PTCR) package comprising:
(a) a PTCR ceramic slug having two major opposing faces;
(b) two glass bonded aluminum electrodes being bonded to said two opposing faces, respectively;
(c) a first group of at least two contact pads being in pressure contact with one of said electrodes and a second group of an equal number of contact pads being in pressure contact with the other of said electrodes; and
(d) means for spring loading each of said metal contact pads against the corresponding contacted of said electrodes, each of said pads having a slightly curved convex surface toward said contacted electrode, the thickness of said glass bonded aluminum electrodes being greater than 0.002 inch to prevent said pads from completely pushing through said electrodes during the service life of said PTCR package.

4,325,052
TRAILER LIGHT CONNECTION SYSTEM

Steve J. Koerner, 2168 Sargent St., Simi Valley, Calif. 93063

Filed Feb. 11, 1980, Ser. No. 120,118
Int. Cl.[3] B60Q *1/00*
U.S. Cl. 340—67 14 Claims



1. Electronic light sensing apparatus for coupling trailer taillight circuits to the taillights of a towing vehicle, said apparatus comprising:

A. light sensing means for detecting the light output from the towing vehicle taillights and converting said output to an electrical signal;

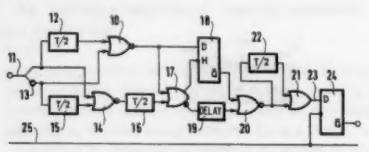
B. circuit means for responding to said electrical signal, including switching means to control said trailer taillight circuits; and

C. means in said circuit means for discriminating normal operation of towing vehicle turn or brake indications from various ambient lighting conditions including continuous reflected sunlight and continuously illuminated running light filaments within the same taillight structure as associated with said turn or brake indications.

4,325,053
METHOD AND A CIRCUIT FOR DECODING A C.M.I. ENCODED BINARY SIGNAL

Pierre Le Brozec, Perros-Guirec; Francois Ferret, Palaiseau, and Pierre Doussoux, Paris, all of France, assignors to Compagnie Industrielle des Telecommunications, Paris, France

Filed Jul. 19, 1979, Ser. No. 58,650
Claims priority, application France, Jul. 26, 1978, 78 22153
Int. Cl.[3] H03K *13/24*
U.S. Cl. 340—347 DD 3 Claims



1. An apparatus for decoding a coded mark inversion (C.M.I.) encoded binary received signal representing a sequence of binary data bits, with each bit occupying a binary bit period, said apparatus comprising:

means for detecting zero-to-one transitions in said received signal;

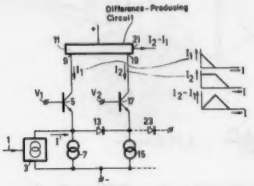
means for detecting one-to-zero transitions in said received signal; and

signal generating means for generating from said received signal a further signal comprising a sequence of pulses each of one bit period duration and synchronized to all zero-to-one transitions in said received signal except any zero-to-one transition which occurs one binary bit period after the immediately preceding one-to-zero transition in said received signal, said further signal comprising an inverted, NRZ-L signal representation of the binary data contained in said received signal.

4,325,054
FOLDING CIRCUIT FOR AN ANALOG-TO-DIGITAL CONVERTER

Rudy J. van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,253
Claims priority, application Netherlands, Aug. 29, 1978, 7808871
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 AD 1 Claim

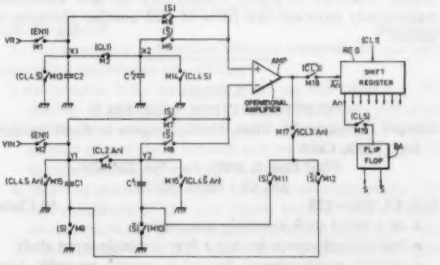


1. A folding circuit for an analog-to-digital converter for converting an input signal monotonously changing in a first direction, up to a certain value, into an output signal monotonously changing in said first direction and, above said certain value, into an output signal monotonously changing in a second direction, said second direction being opposite to said first direction, the folding circuit comprising a first and a second transistor to which the input signal is applied, a first and a second current source connected respectively to the emitters of said first and second transistors, and a difference-producing circuit connected to the collectors of said first and second transistors from which said output signals are obtained, characterized in that said folding circuit further comprises an input current source coupled to the emitter of said first transistor, to which said input signal is applied, for supplying a current proportional to the instantaneous value of said input signal, a threshold element coupled between the emitters of said first and second transistors, and means for applying a first and a second d.c. voltage respectively to the bases of said first and second transistors, whereby the voltage difference between said first and second d.c. voltages is smaller than the threshold voltage of said threshold element.

4,325,055
ANALOG-TO-DIGITAL CONVERTER

Joël S. Colardelle, Les Ulis; Pierre Girard, Septeuil, and Jean-Pierre M. Pillou, Saint-Egreve, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,670
Claims priority, application France, Oct. 27, 1978, 78 30541
Int. Cl.[3] H03K *13/09*
U.S. Cl. 340—347 AD 5 Claims



1. An analog-to-digital converter to provide in N iterations an N-bit digital value for an analog input voltage from a refer-

ence voltage, where N is an integer greater than one, comprising:

a single stage used for each of said N iterations including

a first pair of capacitors each having identical capacity,

a second pair of capacitors each having identical capacity and equal to the capacity of each of said first pair of capacitors,

first means coupled to said first pair of capacitors for charging one of said first pair of capacitors to said reference voltage,

second means coupled between said first pair of capacitors for selectively dividing said charge on said one of said first pair of capacitors between both capacitors of said first pair of capacitors,

third means coupled to said second pair of capacitors for charging one of said second pair of capacitors to said analog input voltage,

fourth means coupled between said second pair of capacitors for selectively dividing said charge on said one of said second pair of capacitors between both capacitors of said second pair of capacitors,

fifth means coupled to said first and second pairs of capacitors for comparing the voltage at the terminals of a selected one of said first pair of capacitors with the voltage at the terminals of a selected one of said second pair of capacitors, and

sixth means selectively coupled to said fifth means and to a selected one of said second pair of capacitors to charge said selected one of said second pair of capacitors with a voltage equal to the difference between the voltage present on the other of said second pair of capacitors and the voltage present on said selected one of said first pair of capacitors; and

a seventh means coupled to said fifth means to store a binary result of each comparison performed by said fifth means.

4,325,056

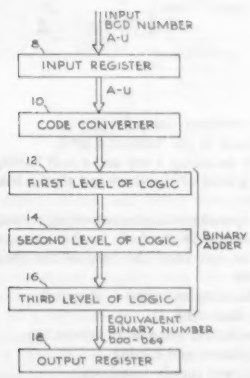
BCD TO BINARY CONVERTER

Daniel P. Wiener, Glendale, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 26,176, Apr. 2, 1979. This application Aug. 22, 1980, Ser. No. 180,255

Int. Cl.³ G06F *5/02*; H03K *13/24*

U.S. Cl. 340—347 DD **7 Claims**



1. Apparatus for converting an input binary coded decimal (BCD) number into an equivalent output binary number comprising:

input means for providing input binary signals representing the digits of said input BCD number;

conversion means responsive to said input binary signals for producing first binary signals representing the binary values of the least significant BCD digit of said input BCD number and second binary signals representing the significant binary digits of the equivalent binary numbers obtained by the separate conversion of different successive pairs of the remaining BCD digits of said input BCD number into true binary form taking into account the order of significance of each pair in said input BCD number;

each of said equivalent binary numbers being representable in the form $a_0a_1a_2 \ldots a_m$ times 2^n, wherein $a_0a_1a_2 \ldots a_m$ are the significant digits of the equivalent binary number, m is the number of significant digits, and n has a value which provides the proper magnitude of the equivalent number; and

binary adder means for adding said first and second binary signals in columns formed by taking into account their order of significance as indicated by their 2^n values for producing output binary signals representing said output binary number.

4,325,057

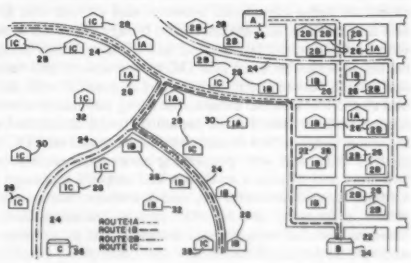
SCHOOL BUS APPROACH NOTIFICATION METHOD AND APPARATUS

Michael K. Bishop, Fort Wayne, Ind., assignor to Bishop-Hall, Inc., Geneva, Ind.

Filed Jun. 30, 1980, Ser. No. 164,014

Int. Cl.³ G08G *1/12*

U.S. Cl. 340—539 **17 Claims**



1. A school bus approach notification system employed in a geographical area having a school, a plurality of residences, a bus route extending in close proximity to said residences, and a school bus, said system comprising:

a radio wave transmitter mounted in said bus and having first means for transmitting at least one radio frequency signal, said signal having an identifying characteristic,

a plurality of radio receivers located, respectively, in said plurality of residences, each receiver having second means for tuning said receiver to receive said transmitted signal and for producing an output signal in response to said transmitted signal having said predetermined characteristic,

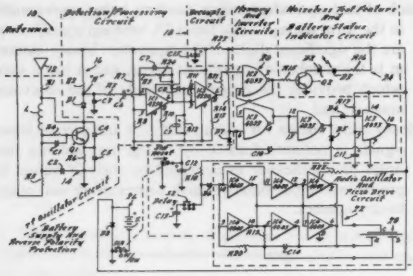
said receiver having third means for determining the distance of reception of said transmitted signal between said transmitter and receiver at which said receiver first responds to said transmitted signal to produce said output signal, and

fourth means coupled to said second means and responsive to said output signal for producing at least one of visual and audio approach notice signals whereby said fourth means will produce a notice signal only when said transmitter is at or less than said distance from said receiver to provide advance notice at the respective residences of the approach of said bus.

4,325,058
PRE-INTRUSION DETECTION AND ALARM SYSTEM

William E. Wagner, Holland, and Ivan Zachev, Muskegon, both of Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Jun. 11, 1980, Ser. No. 158,619
Int. Cl.[3] G08B 13/26
U.S. Cl. 340—562 9 Claims

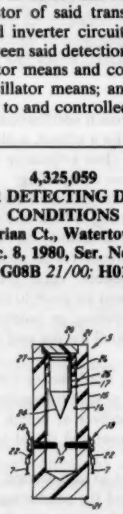


1. In a detection and alarm system, the combination including an antenna; a DC power source; a first resistor; a tank circuit including said antenna, an inductor, and first and second capacitors; an rf oscillator circuit; said rf oscillator circuit including said tank circuit, a transistor having an emitter, a collector and a base, third and fourth capacitors, and second, third and fourth resistors; said inductor being connected to said antenna through said first resistor; said first capacitor being connected across said emitter and said collector; said second capacitor being connected between said emitter and ground; said first and second capacitors also being connected in parallel with said inductor; said second and third resistors being connected in series between said DC power source and said base; said fourth resistor being connected in parallel with said second capacitor; said third capacitor being connected across said second resistor; said fourth capacitor being connected across the series combination of said third resistor and said DC power source; detection and processing means connected to said collector and effective to detect and amplify a change in the voltage at said collector of said transistor; audio oscillator means; a memory and inverter circuit including time delay means connected between said detection and processing means and said audio oscillator means and controlling the energization of said audio oscillator means; and an audio transducer electrically connected to and controlled by said audio oscillator means.

4,325,059
SENSOR FOR DETECTING DELETERIOUS CONDITIONS

Richard C. Jaye, 12 Brian Ct., Watertown, Wis. 53094

Filed Dec. 8, 1980, Ser. No. 214,198
Int. Cl.[3] G08B 21/00; H01H 37/75
U.S. Cl. 340—585 7 Claims



1. A sensor for connecting an electrically operated alarm signaling device in an energizing circuit in response to existence of a deleterious condition, characterized by:

A. a body in which there is a well that has top and bottom ends and which can be supported with the axis of said well extending substantially vertically;

B. a pair of contact elements fixed to said body, normally insulated from one another and connectable in an electrical energizing circuit, said contact elements comprising a pair of opposing contacts exposed in said well at a location spaced from both of said ends thereof, said contacts being at opposite sides of the axis of the well and spaced apart by a distance less than the diameter of the well at said location;

C. a gravity actuated slider having

(1) a substantially cylindrical body portion that is guided by the well for up and down motion therein relative to the body and comprises a substantial portion of the mass of the slider, and

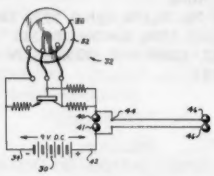
(2) a substantially concentric contact portion which, in a normal position of the slider, is spaced from said contacts in the direction towards the top end of the well, said contact portion tapering in the opposite direction to wedgingly engage said contacts and provide a good electrical connection between them when the slider falls from its normal position towards the bottom end of the well; and

D. said body and said slider being arranged for cooperation with a quantity of material which is normally solid and which engages the slider to support it in its normal position, said material being capable of disintegrating in the presence of said deleterious condition to release the slider for fall from its normal position.

4,325,060
FLOATING WATER DETECTOR

Jack L. Purtell, and Rufus J. Purtell, both of P.O. Box 1152, Brownfield, Tex. 79316

Filed Dec. 17, 1979, Ser. No. 104,146
Int. Cl.[3] G08B 21/00, 3/10
U.S. Cl. 340—604 1 Claim



1. A water detector comprising:

a. an enclosure in the form of a shell,

b. said shell including a top and a hull having a flat bottom forming a base of the shell and thus a base of the water detector,

c. a pair of spaced electrodes extending through and exposed on the bottom of the hull, so that the water detector is adapted to rest upon the base of the shell and thus the electrodes,

d. a sonic housing mounted in the shell,

e. an alarm including

i. a piezoelectric transducer driven by

ii. an oscillator, and having

iii. two power supply terminals,

f. said alarm in said sonic housing,

g. a battery having two battery terminals in said shell, and

h. circuit connectors consisting of:

i. one of the battery terminals solely connected to one of the electrodes,

ii. the other electrodes solely connected to one of the power supply terminals on the alarm, and

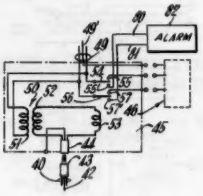
iii. the other power supply terminal solely connected to the other battery terminal,

j. so that the alarm is activated upon bridging the space between the electrodes by moisture.

4,325,061
PROTECTIVE MEANS FOR ATTACHMENTS AFFIXED TO ELECTRICALLY OPERATED BEDS

William Wolar, 59 Fremont Rd., North Tarrytown, N.Y. 10591

Filed Oct. 27, 1980, Ser. No. 200,990
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—679 13 Claims

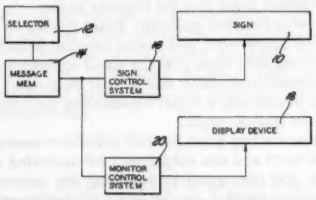


1. A protective device for use with an attachment affixed to a bed having electrically operated elevating means to interrupt continued elevation of the bed should the attachment encounter an obstacle adjoining the bed comprising switch means carried by said attachment, switch actuating means on said attachment and positioned to engage an obstacle in advance of said attachment, electric control means interconnected with said electrically operated elevating means and said switch means whereupon operation of said switch means by said actuating means will interrupt continued elevation of said bed.

4,325,062
MONITOR FOR BUS DESTINATION SIGNS

Thomas A. Devlin, Waterford, Mich., assignor to Vultron, Incorporated, Waterford, Mich.

Filed Dec. 6, 1979, Ser. No. 101,395
Int. Cl.[3] G09G 3/00
U.S. Cl. 340—717 3 Claims

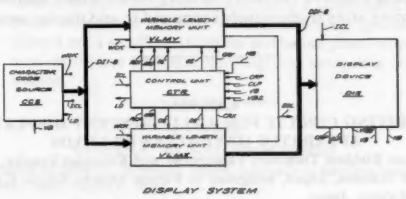


1. A bus destination sign of the type comprising a changeable alphanumeric display device, said device being electromechanically actuated to change from one display to another, the display being persistent until re-actuated, a message memory for storing multiple messages in a binary digit code, manually controlled selector means coupled with the memory for accessing the memory to continuously produce a coded signal corresponding to a selected one of the messages, and sign control means coupled with the memory and responsive to said coded signal for changing the alphanumeric display device to display a message corresponding to the coded signal produced by said memory, the improvement comprising a message monitor including an electronic alphanumeric display device having electronic display elements, and monitor control means coupled between said memory and said display device and being responsive to the output of said memory for causing the electronic display device to display a message corresponding to the coded signal produced by said memory whereby the message displayed by the electronic display device may be compared with the selected message.

4,325,063
DISPLAY DEVICE WITH VARIABLE CAPACITY BUFFER MEMORY

Morton B. Herman, Queens Village, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

Continuation of Ser. No. 851,818, Nov. 16, 1977, abandoned.
This application Jun. 11, 1979, Ser. No. 47,625
Int. Cl.[3] G09G 1/14
U.S. Cl. 340—750 6 Claims



1. A display system comprising: a character code source of coded combinations of bits representing characters; a first source of incrementing signals occurring each time a coded combination of bits is emitted by said character code source; a display means for visually displaying the characters represented by the coded combinations of bits; a second source of incrementing signals occurring each time said display means requires one of said coded combinations of bits; a first buffer memory means connecting said character code source to said display means and comprising an addressed memory array having a plurality of addressed storage registers, each of said storage registers being capable of storing one of said coded combinations of bits, and address counter means for generating the addresses of said addressed register, incrementing means for incrementing the count in said address counter means each time an incrementing signal is received from said first or second source, writing means responsive to each incrementing signal from said first source for writing a coded combination of bits from said character code source into an addressed register indicated by said address counter means, and reading means responsive to each incrementing signal from said second source for reading the coded combination bits stored in an addressed register indicated by said address counter means and transferring said coded combination of bits to said display means; second buffer memory means connecting said character code source to said display means and comprising an addressed memory array having a plurality of addressed storage registers, each of said storage registers being capable of storing one of said coded combinations of bits, and address counter means for generating the addresses of said addressed registers, incrementing means for incrementing the count in said address counter means each time an incrementing signal is received from said first or second source, writing means responsive to each incrementing signal from said first source for writing a coded combination of bits from said character code source into an addressed register indicated by said address counter means, and reading means responsive to each incrementing signal from said second source for reading the coded combination bits stored in an addressed register indicated by said address counter means and transferring said coded combination of bits to said display means; controlled initializing means for cleaning said address counter means each time a set of coded combination of bits is to be transferred to said buffer memory means and each time said set is to be transferred from said buffer memory means to said display means; means for controlling said initializing means to clear the address counter means of each of said buffer memory means; connecting means for alternately, first, operatively connecting said addressed memory array of said first buffer memory means to said character code source and operatively connecting said addressed memory

array of said second buffer memory means to said display means, and, second, operatively connected said addressed memory array of second buffer memory means to said character code source and operatively connecting said addressed memory array of said first memory means to said display means; and means for feeding said first incrementing signals to the incrementing means and the writing means of the buffer memory means whose addressed memory array is operatively connected to said character code source and for feeding said second incrementing signals to the incrementing means and the reading means of the buffer memory means whose addressed memory array is operatively connected to said display means.

4,325,064

DRIVING CIRCUIT FOR A FLUORESCENT DISPLAY APPARATUS HAVING FEWER LEADS

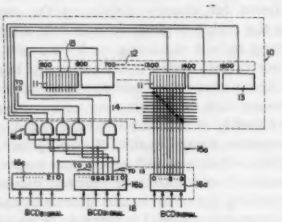
Takao Kishino; Toshihiro Yamaguchi, and Kazunori Tanaka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Nov. 29, 1979, Ser. No. 98,690

Claims priority, application Japan, Nov. 30, 1978, 53-163766[U]

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—753 **3 Claims**



1. A fluorescent display apparatus comprising:

a vacuum casing made up of a substrate and a front cover airtightly bonded together;

a plurality of anodes each coated with a phosphor layer on the upper surfaces thereof and disposed on said substrate;

said anodes being divided into consecutive several groups so as to include a certain number of anodes in each of said anode groups;

each of said anodes disposed in corresponding positions of said respective anode groups being connected together in parallel;

a plurality of control electrodes each provided in an opposite relationship with respect to said respective anode groups;

a filamentary cathode stretched above said control electrodes for emitting thermions when energized and heated;

a first decoder means for decoding the least significant digit of an input signal and thereby selecting a plurality of anodes having corresponding positions in said respective anode groups; and

a second decoder means for decoding at least two more significants digits of said input signal and, thereby selecting one of said control electrodes whereby one of said anodes selected by said first and second decoders representing the value of said input signal is illuminated;

wherein said second decoder means includes a first decoder and a second decoder for receiving said at least two more significant digits and a plurality of AND gates said AND gates each having a first input connected to one output of said first decoder and a second input connected to the output of said second decoder.

4,325,065

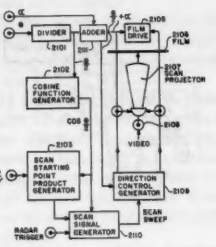
BISTATIC IMAGING RADAR PROCESSING FOR INDEPENDENT TRANSMITTER AND RECEIVER FLIGHTPATHS

William J. Caputi, Jr., Centerport, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 9, 1979, Ser. No. 65,213

Int. Cl.³ G01S *13/90*

U.S. Cl. 343—5 CM **4 Claims**



1. Apparatus for correcting data from a bistatic synthetic aperture radar, of the type employing Stretch and Spotlight techniques to eliminate distortions due to the relative positions and motions of the radar transmitter and receiver with respect to a target, said apparatus accepting signals representing the bistatic angle, the receiver angle, the transmitter start frequency divided by the slope of the transmitted FM signal, the radar trigger and the received radar video, comprising:

(a) a divider means, having an input port and an output port, said divider means accepting at its input port the signal representing the bistatic angle, and producing at its output port a signal representing one-half the bistatic angle,

(b) an adder means having two input ports and an output port, said adder means accepting at one input port, the receiver angle and at its other input port the signal representing one-half the bistatic angle from said divider means, and producing at its output a signal representing one-half the bistatic angle plus the receiver angle,

(c) a cosine function generator means having an input port and an output port, said cosine function generator means accepting at its input port the signal representing one-half the bistatic angle from said divider means and producing at its output port a signal representing the cosine of one-half the bistatic angle,

(d) a scan starting point product generator means with two input ports and one output port for accepting at the first input port the signal representing the transmitter start frequency divided by the slope of the transmitted FM signal and at the second input port the cosine of half of the bistatic angle for producing at the output port a signal representing the product of the two input signals,

(e) a scan signal generator means with three input ports and one output port for accepting at its input ports signals representing said product, the cosine of one-half the bistatic angle and the radar trigger to produce at its output a scan sweep signal where the scan is initiated at a starting point which is at a distance away from the origin that is proportional to said product, the scan is compressed by an amount proportional to the cosine of one-half the bistatic angle and the scan is initiated from the starting point in synchronism with the radar trigger,

(f) a direction control means having two input ports and an output port for accepting at its input ports a signal representing one-half the bistatic angle plus the receiver angle from the adder means and the output signal of the scan signal generator means to produce an output control signal which sets the scan direction at an angle equal to one-half the bistatic angle plus the receiver angle from an arbitrary reference angle, and

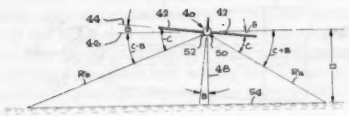
(g) a scan projector means having two input ports and an output port, said scan projector accepting at its input ports the output signals of the direction control generator means and the video signal of the radar receiver to project a scan at an angle which is equal to one-half the bistatic angle plus the receiver angle from an arbitrary angular reference, beginning at a starting point a distance from the origin proportional to the starting frequency of the transmitter divided by the slope of the transmitted FM signal, said scan being compressed proportional to the cosine of the bistatic angle after initiation.

4,325,066

OVERWATER RADAR NAVIGATION SYSTEM

Thomas L. Grettenberg, 2943 Briarwood Dr., Torrance, Calif. 90505

Filed Sep. 15, 1980, Ser. No. 187,351
Int. Cl.³ G02S *13/08*
U.S. Cl. 343—7 ED **12 Claims**



1. A method for correcting the assumed orientation of an inertial navigation system on an aircraft flying over water, to more closely correspond with the actual local horizontal or vertical, comprising:

directing an electromagnetic beam from the aircraft along a boresight which is at a precisely known downward angle from the inertial horizontal and along a compass direction that is precisely known with respect to the inertial system, detecting the reflection to determine the range to the earth's surface along that boresight, and generating a real distance signal representing the actual range;

generating data representing the expected range along said boresight to the earth's surface based upon the assumed orientation of the inertial navigation system; and

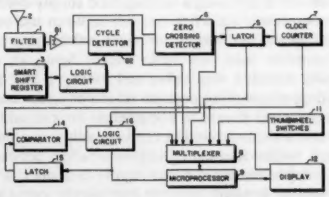
comparing said real signal and said data, and correcting the assumed orientation of the inertial navigation system in accordance with the relative values of said real signal representing the actual range and said data representing the expected range.

4,325,067

METHOD AND APPARATUS FOR REMOVING NOISE IN A LORAN-C NAVIGATION RECEIVER

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 937,615, Aug. 28, 1978. This application Apr. 9, 1979, Ser. No. 28,142
Int. Cl.³ G01S *1/24*
U.S. Cl. 343—103 **7 Claims**



1. Apparatus for removing the effects of noise generated internal to a navigation receiver-indicator that provides navigation information comprising

means for periodically generating a first signal,

first means responsive to said first signal for periodically inverting the phase of said received navigation signals in the front end of said receiver to cause noise generated in said front end of said receiver to average out and thereby be effectively removed, and

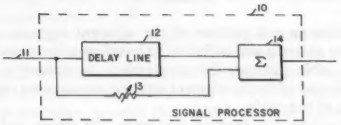
second means responsive to said first signal for reinverting the phase of said navigation signals to remove the phase inversion introduced by said first means, said phase reinversion of said navigation signals being accomplished at a point within said receiver whereat internally generated noise is not a significant problem and before phase reinversion introduces problems deriving said navigation information.

4,325,068

LORAN-C SIGNAL PROCESSOR

William R. Mercer, Belmont, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 26, 1978, Ser. No. 918,750
Int. Cl.³ G01S *1/24*
U.S. Cl. 343—103 **11 Claims**



1. A signal processor processing amplitude modulated radio frequency signals of known carrier frequency to improve the signal-to-noise ratio in portions thereof having rapid rate of modulating envelope change comprising:

a first transmission means to which said radio frequency signals are applied and are scaled in amplitude by a known scaling factor before being output therefrom;

a second transmission means to which said radio frequency signals are also applied to be delayed in time by an integral multiple of one-half periods of the carrier frequency of said radio frequency signal with relationship to said first transmission means before being output therefrom; and

means for algebraically combining the radio frequency signals output from both said first and second transmission means when their differential delay is an odd integral multiple of one-half carrier periods, to produce a new signal having an improved signal-to-noise ratio in the portions thereof having rapid rate of modulating envelope change.

4,325,069

CONVERTIBLE TELESCOPIC ANTENNA

Joseph F. Hills, Scottsdale, Ariz., assignor to Jimmy's Radio & Televison Corp., Phoenix, Ariz.

Filed Feb. 7, 1980, Ser. No. 119,634
Int. Cl.³ H01Q *1/10, 9/36*
U.S. Cl. 343—750 **8 Claims**

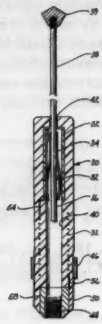
1. A method for converting a power driven cable actuated retractable multi-segment AM/FM broadcast band antenna to an antenna for use with AM/FM broadcast band receivers and a citizens band two-way communications unit, which antenna prior to conversion includes a top segment attached to an end of the cable which top segment draws out the remaining segments on extension of the cable and nests the remaining segments on retraction of the cable, a cap attached to an adjacent segment for precluding disengagement of the top segment from the adjacent segment on extension of the cable while accommodating nesting of the segments in response to the

cable induced force exerted by a tip element secured to the free end of the top segment bearing against the cap on retraction of the cable, said method comprising the steps of:

(a) removing the cap from the adjacent segment;

(b) disengaging the tip element from the top segment;

(c) penetrably mounting a loading coil for altering the electrical parameters of the antenna upon the top segment, which loading coil includes a passageway extending therethrough and having one end of sufficient diameter to



receive an end portion of the adjacent segment and another end of a size sufficient to interfere with translation of the cable through the passageway on extension of the cable and of the tip element into the passageway on retraction of the cable;

(d) attaching the loading coil upon the upper end of the adjacent segment in substitution of the cap; and

(e) re-engaging the tip element to the top segment to form a shoulder bearing against the loading coil to cause nesting of the segments on retraction of the cable.

4,325,070

RECORDING HEAD FOR FACSIMILE RECEIVERS

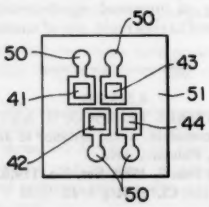
Isamu Akasaki; Masaaki Ohsima; Nobuhide Matsuda; Michio Matsuki, all of Kawasaki; Yoshio Tsukamoto, Tokyo; Hiromichi Kagi, Tokyo, and Hidehalu Fukazawa, Tokyo, all of Japan, assignors to Matsushita Electric Ind. Co., Ltd. and Matsushita Graphic Communication Systems, Inc., both of Tokyo, Japan

Filed Nov. 2, 1979, Ser. No. 90,685

Claims priority, application Japan, Nov. 7, 1978, 53-137570

Int. Cl.³ G01D *9/42*

U.S. Cl. 346—108 **1 Claim**



1. A recording head for use in a facsimile communication system having a recording medium on which an image is produced in response to said recording head upon activation and means for moving said recording head relative to the surface of said recording medium in a first direction to scan along each of a plurality of lines across said medium and in succession between the lines in a second direction perpendicular to said first direction, comprising a plurality of light emitting diodes arranged in first and second rows, said diodes being spaced apart from each other in said first direction, each of said diodes having a quadralateral light emitting area and an electrode surrounding said quadralateral area, the electrode of each of said light emitting diodes being spaced apart from the electrodes of adjacent light emitting diodes, the light emitting areas of the diodes of said second row being offset from each other by a distance equal to the length of a side of each light emitting area in said second direction and staggered in position relative to those of the light emitting areas of the diodes of said first row so that edges of said light emitting areas of said first row are aligned in said first direction with edges of said light emitting areas of said second row.

4,325,071

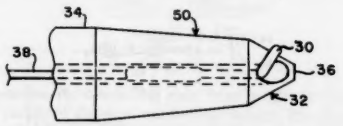
THERMAL RECORDING STYLUS

Raghuvir Rai, Los Angeles, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Sep. 15, 1980, Ser. No. 187,193

Int. Cl.³ G01D *15/16, 15/10*

U.S. Cl. 346—139 C **4 Claims**



1. A thermal recording stylus comprised of a ceramic tip with a frustum-shaped end, and an electrical heating element wrapped around said frustum-shaped end over a substantial part of the curved surface thereof to heat said tip for the purpose of thermal recording with the flat surface thereof, and electrical leads for applying electrical power to said element.

4,325,072

WRITING DEVICE CONTROL APPARATUS

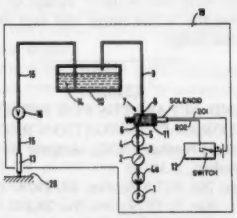
Hans-Dieter Rösel, Altdorf, Fed. Rep. of Germany, assignor to Firma J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,246

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827718

Int. Cl.³ G01D *15/16;* B41J *27/00*

U.S. Cl. 346—140 R **6 Claims**



1. In an apparatus for controlling the feed of writing fluid to a writing device comprising a writing fluid supply container, a source of compressed air, a first conduit between said source of compressed air and said supply container, a first valve means in said first conduit, said first valve means being an electromechanically actuated stop valve and having a first position corresponding to a writing position which provides communication between said source of compressed air and said supply container and a second position corresponding to a non-writing position which terminates communication between said source of compressed air and said supply container, a writing device, a second conduit between said supply container and said writing device, and a second valve means in said second conduit, said second valve means having an open position

allowing writing fluid to pass therethrough when said first valve means is in said first position and said supply container is pressurized by said source of compressed air and having a closed position preventing writing fluid from passing therethrough when said first valve means is in said second position and said communication between said source of compressed air and said supply container is terminated, whereby when said first valve means is in said first position, said writing fluid flows through said second valve means to said writing device and when said first valve means is in said second position, said writing fluid is prevented from flowing to said writing device, said second valve means being an escape valve comprised of a valve body having a cylindrical valve chamber in which a spherical valve member is moveable, said spherical valve member having substantially the same diameter as the diameter of said cylindrical valve chamber to thereby provide a close fit and liquid-closure relationship between said spherical valve member and said cylindrical valve member, and a biasing means biasing said spherical valve member toward a closed direction in said cylindrical valve chamber, said spherical valve member providing said close fit and liquid-closure relationship with said cylindrical valve chamber during at least a part of the movement of said spherical valve member toward said closed direction to thereby create a slight sucking back of the writing fluid within said writing device during said movement of said spherical valve member toward said closed direction.

4,325,073

FIELD EFFECT DEVICES AND THEIR FABRICATION

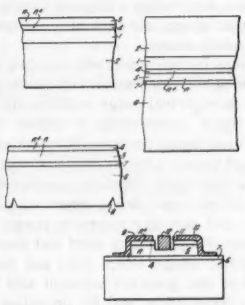
Brian T. Hughes, Sandy; Reuben Redstone, Letchworth; John C. Vokes, Harpenden, and David R. Wight, Hitchen, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 31, 1979, Ser. No. 44,274

Claims priority, application United Kingdom, May 31, 1978, 25553/78

Int. Cl.³ H01L *29/80, 21/208*

U.S. Cl. 357—22 **20 Claims**



1. A method of fabricating a field effect transistor comprising the steps of forming a high quality buffer layer of semiconductor material on the surface of a first substrate of semiconductor material, thereafter forming an active layer of semiconductor material over said buffer layer and over said surface of said first substrate, applying a second substrate of insulating material to the surface of the structure comprising the first substrate, buffer layer, and active layer so that the active layer lies between the two substrates, removing the first substrate and buffer layer, and forming source, drain and gate electrodes over the surface of the active layer opposite the second substrate.

2. A field effect transistor fabricated by the method of claim 1.

4,325,074

SEMICONDUCTOR SWITCHING DEVICE

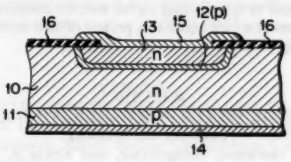
Yoshihide Osada, and Syuji Sugioka, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 837,271, Sep. 27, 1977, abandoned. This application Nov. 9, 1979, Ser. No. 92,727

Claims priority, application Japan, Sep. 28, 1976, 51-115406

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—37 **4 Claims**



1. A semiconductor switching device comprising:

a substrate of one conductivity type;

a first semiconductor region of the opposite conductivity type formed in a first surface region of said substrate to provide a planar structure, said first semiconductor region having a depth of not more than 10 microns and a surface concentration of 10^{20};

a second semiconductor region of said one conductivity type formed in said first semiconductor region to provide a planar structure, said second semiconductor region having a depth of not more than 5 microns and a surface concentration greater than said surface concentration of said first semiconductor region; and

a third semiconductor region of said opposite conductivity type provided on a second surface region of said substrate.

4,325,075

DIGITAL TELEVISION VIDEO SIGNAL STORAGE SYSTEM

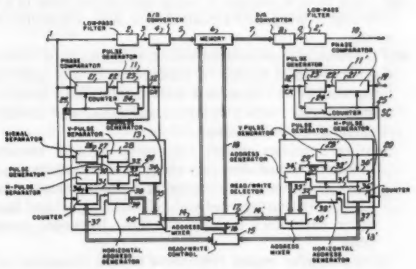
Kazuo Kashigi, and Toshitake Kouyama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,209

Claims priority, application Japan, Sep. 11, 1979, 54-116490

Int. Cl.³ H04N *9/02, 9/491*

U.S. Cl. 358—13 **5 Claims**



1. A storage system for a color television signal, said color television signal including horizontal and vertical synchronizing signals and a color subcarrier, said system comprising:

memory means responsive to write-in address data for storing said color television signal, said memory means including a plurality of memory blocks;

means responsive to said horizontal and vertical synchronizing signals and said color subcarrier for producing said write-in address data; and

means for producing read-out address data, the stored television signal being read out in response to said read-out address data;

said write-in address data producing means including:

means responsive to said vertical synchronizing signal for producing write-in vertical address data:

means for multiplying said write-in vertical address data by a predetermined amount;

memory-block selecting counter means for producing memory-block selecting data, said television signal being written into a particular memory block selected by said memory-block selecting data; and

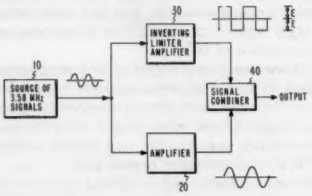
memory address counter means for loading output data from said multiplying means at a rate equal to a period of said horizontal synchronizing signal and for counting memory addresses at a rate equal to a period of said memory-block selecting counter.

4,325,076

ELECTRONIC FILTER FOR GENERATING A THIRD HARMONIC SIGNAL

Leopold A. Harwood, Bridgewater, and Erwin J. Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1980, Ser. No. 147,580
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 **5 Claims**



5. In a color television receiver for processing a color television signal with a luminance component frequency interleaved with a chrominance component including a color subcarrier, said receiver including a source of sinusoidal reference signals at the frequency of said color subcarrier; means for processing said chrominance component; a charge transfer device comb filter responsive to a timing signal and to said television signal for providing an output combed chrominance component and an output combed luminance component; and a source of timing signals for said comb filter; wherein:

said comb filter is realized in integrated circuit form in a first monolithic integrated circuit device with a common substrate;

said chrominance processing means, said source of reference signals and said source of timing signals are realized in integrated circuit form in a second monolithic integrated circuit device with a common substrate, said source of timing signals comprising

limiting amplifier means responsive to said sinusoidal reference signal for providing a substantially square wave output signal comprising a fundamental component at the frequency of said reference signal and higher order harmonics including a third harmonic component;

linear amplifier means responsive to said sinusoidal reference signal for providing a sinusoidal output signal with a magnitude substantially equal to the magnitude of said fundamental component of said square wave output signal; and

means for combining output signals from said limiting and linear amplifier means with a sense for substantially cancelling said fundamental component so as to produce a signal at an output of said combining means comprising said desired third harmonic component and higher order harmonics of lesser magnitude relative to said third harmonic component to the substantial exclusion of said fundamental component; and wherein

said receiver further includes

means external to said first and second integrated circuits for coupling said combed chrominance component from said first integrated circuit to said chrominance processing means in said second integrated circuit; and

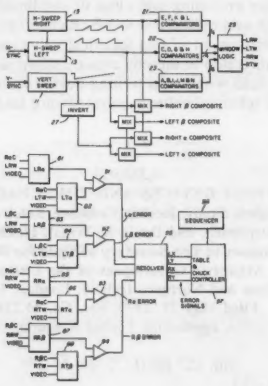
means external to said first and second integrated circuits for coupling said output signal from said combining means in said second integrated circuit to said comb filter in said first integrated circuit as said comb filter timing signal.

4,325,077

AUTOMATIC WAFER ALIGNMENT SYSTEM

Richard M. Dunham, Merrimack, N.H., assignor to GCA Corporation, Bedford, Mass.

Filed May 19, 1980, Ser. No. 151,296
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **15 Claims**



1. Apparatus for locating a diagonal feature in a video signal representing an image, said apparatus comprising:

signal sampling means;

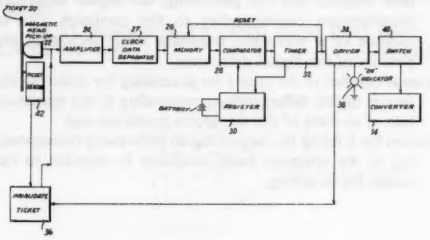
timing means for operating said sampling means to sample portions of the video signal representing a first diagonal section through said image, and to sample portions of the video signal representing a second diagonal section through said image portion which second section is parallel to and closely adjacent said first section, and for providing a first signal responsive to the relative amplitudes of said samples, said timing means being also operative to operate said sampling means to sample portions of the video signal representing third and fourth diagonal sections of said image, which third and fourth sections are parallel to and generally adjacent said first and second sections respectively, and for providing a second signal which is responsive to the relative amplitudes of said third and fourth sections, said timing means being responsive to a control signal for positioning said four sections collectively within said image;

logic means responsive to said first and second signals, said logic means including means for scanning said control signal to sweep said sections collectively across the image in the absence of a parallel feature in the portion of the image traversed by said first and second sections, and including also servo means for varying said control signal in response to said first signal in a sense causing said first and second image sections to bracket a parallel feature in said image when said second signal indicates a feature is traversed by said sections.

4,325,078
PAY PER VIEW TELEVISION CONTROL DEVICE

John C. Seaton, Norwalk, Conn., and Leonard Cohen, Pearl River, N.Y., assignors to The TeleMine Company, Inc., New York, N.Y.

Continuation of Ser. No. 969,458, Dec. 14, 1978, abandoned. This application Nov. 20, 1979, Ser. No. 95,973
Int. Cl.[3] H04N 7/16
U.S. Cl. 358—117 7 Claims



1. Apparatus for providing limited access to television programs comprising

a reader having an input for receiving a record medium on which there is recorded data including representations of a pre-determined period of time for said access and an output at which there are generated electrical signals corresponding to the data recorded on said medium,

a reference signal generator having an output at which there are generated pre-determined electrical signals corresponding to a reference data record, said reference signal generator including timing means for continuously generating signals indicative of elapsed time from a pre-determined reference time, said output comprising said elapsed time signals,

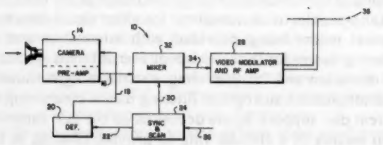
a comparator for comparing the output signals of said reader with the output signals of said signal generator and having an output at which there is generated a validity signal indicative of a correspondence between said reader and reference signal generator output signals, and

a switching device having an "On" state and an "Off" state and being responsive to said comparator for being in said "On" state only during the occurrence of said validity signal, said switch means enabling access to said television programs when in said "On" state and preventing access when in said "Off" state.

4,325,079
SECURE VIDEO TRANSMISSION SYSTEM

William D. Little, 3548 Townsend Dr., Dallas, Tex. 75229

Filed Jun. 9, 1980, Ser. No. 157,790
Int. Cl.[3] H04N 7/16
U.S. Cl. 358—120 4 Claims

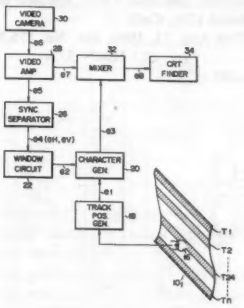


1. A method for securing information carried by a composit video signal against unauthorized interception, the composit video signal including horizontal and vertical synchronizing pulses and equalizing pulses as well as a video component, said method comprising the step of transmitting the synchronizing and equalizing pulses in the form of a composite pulse train during recurring video blanking intervals, wherein said composite pulse train is characterized by a train of horizontal synchronizing pulses preceded by a group of vertical synchronizing pulses and first and second groups of equalizing pulses occurring immediately prior to and following the vertical pulse group, the pulses of the equalizing and vertical synchronizing groups each occurring at a plural multiple of the frequency of the horizontal pulses, the pulses of the vertical synchronizing group being relatively greater in amplitude as compared with the amplitudes of the horizontal synchronizing and equalization pulses, respectively, and the pulse width of each vertical synchronizing pulse being substantially less than the interval between successive vertical synchronizing pulses.

4,325,080
APPARATUS FOR DISPLAYING VIDEO TRACK NUMBER IN VIEWFINDER OF VIDEO CAMERA

Ken Satoh, Akigawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,774
Claims priority, application Japan, Apr. 24, 1979, 54-50684; Apr. 24, 1979, 54-50685
Int. Cl.[3] H04N 5/26, 5/78
U.S. Cl. 358—127 9 Claims



6. A video track display apparatus for a multitrack (VTR) video tape recorder and coupled to a viewfinder arranged in a video camera for displaying frames of a video signal in the viewfinder of the video camera, said video track display apparatus comprising:

first means coupled to said video tape recorder for providing a track position signal representing the position of a track being used for video recording or playback;

second means coupled to said first means for providing a character signal corresponding to said track position signal; and

a third means located within said viewfinder of each video camera and coupled to said second means for displaying at least one character representing said track position according to said character signal.

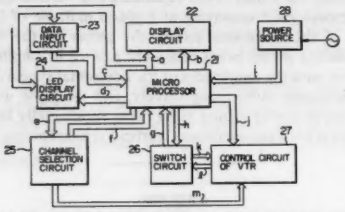
4,325,081
PROGRAMMED TIMER FOR VTR

Yuuhei Abe, Yokohama, and Katsuo Mohri, Yokosuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1980, Ser. No. 163,297
Claims priority, application Japan, Aug. 10, 1979, 54-101272
Int. Cl.[3] H04N 5/76
U.S. Cl. 358—127 10 Claims

1. A programmed timer for presetting a controlling device for a plurality of time when the device starts and ends, comprising clock means, means for entering reservation data, means for processing the entered data, display means for displaying the current time data from said clock means and the

entered data, and means for sequentially displaying a procedure to be next entered according to the predetermined procedure order thereof, each time data is entered through said reservation data entering means.

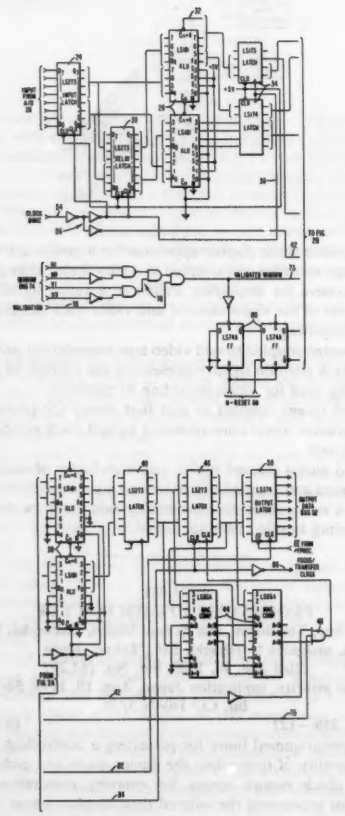


4,325,082

DIGITAL MEASUREMENT SYSTEM FOR AUTOMATICALLY FOCUSING A TELEVISION CAMERA

Karl H. Griesshaber, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 11, 1980, Ser. No. 176,737
Int. Cl.³ H04N 5/34
U.S. Cl. 358—218 **9 Claims**



1. A system for measuring, during a television camera setup mode, the optimum focus condition for an electron beam in a pickup tube, wherein the tube generates a waveform of abrupt transitions corresponding to transitions in a black/white checkered test pattern, comprising:

means for supplying successive digital data samples indicative of the waveform transitions;

latch means for delaying alternate digital data samples by one sample interval;

means coupled to receive the delayed and undelayed digital data samples and for generating the digital difference therebetween corresponding to the maximum rate of risetime of a waveform transition while indicating the polarity of the digital difference;

means coupled to the means for generating for detecting the largest digital differences corresponding to the maximum rate of risetime of the waveform transition; and

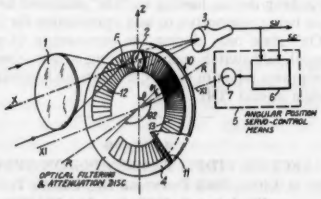
means for holding the largest digital differences corresponding to the optimum focus condition in response to the means for detecting.

4,325,083

HIGH DYNAMICS MULTISPECTRAL OPTO-ELECTRICAL RECEIVER SYSTEM

Jean M. Rouchon, and Jean P. Lepeytre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 30, 1980, Ser. No. 144,972
Claims priority, application France, May 2, 1979, 79 11021
Int. Cl.³ H04N 5/26, 5/33
U.S. Cl. 358—228 **4 Claims**



1. A high dynamics multispectral opto-electrical receiver system incorporating optical means for the reception and focusing of light radiation to form the image of the field observed on an opto-electrical transducer for video signal detection, said optical means being provided with attenuation and optical filtering means for the selection of two different spectral bands of operation and for providing a variable light transmission, said attenuation and optical filtering means comprising a transparent disc support, layers deposited on the said support along two sectors of a circular ring to provide filtering in the said two bands respectively and attenuation variation as a function of the angular position of the disc, said layers comprising two graded angular attenuators symetrically produced with respect to a reference diameter, said sectors being joined at one end by a high density area to seal the light transmission, and separated at the other end by a minimum density area to produce substantially no attenuation, and a servo-control device to rotate said disc and to control its angular position as a function of the video signal value.

4,325,084

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME, AS WELL AS A PICK-UP DEVICE AND A DISPLAY DEVICE HAVING SUCH A SEMICONDUCTOR DEVICE

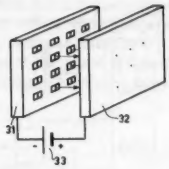
Gerardus G. P. van Gorkom, and Arthur M. E. Hoeberechts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 971,767, Dec. 21, 1978, Pat. No. 4,259,678. This application Jul. 21, 1980, Ser. No. 170,363

Claims priority, application Netherlands, Jan. 27, 1978, 7800987

Int. Cl.[3] H04N *3/14, 3/16;* H01L *29/90;* H01J *19/02*

U.S. Cl. 358—241 10 Claims



1. A method of manufacturing a semiconductor device comprising the steps of forming a semiconductor body having a p-n junction with a depletion zone at least locally adjoining a surface of said semiconductor body, providing an electrically insulating layer on said surface, providing an electrically conductive layer on said insulating layer, and forming an aperture through both said conductive layer and said insulating layer to at least a portion of said depletion zone at said surface exposed through said aperture.

4,325,085

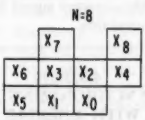
METHOD AND APPARATUS FOR ADAPTIVE FACSIMILE COMPRESSION USING A TWO DIMENSIONAL MAXIMUM LIKELIHOOD PREDICTOR

Robert P. Gooch, Gaithersburg, Md., assignor to Digital Communications Corporation, Germantown, Md.

Filed Jun. 9, 1980, Ser. No. 157,609

Int. Cl.[3] H04N *1/40*

U.S. Cl. 358—261 25 Claims



1. A data compression device for information scanned in two dimension and represented by a serial stream of pixel representations, comprising:

first buffer means for storing at least some of said pixel representations sufficient to represent a portion of said information extending in both said dimensions;

predictor means coupled to said first buffer means for generating, from at least three pixel representations, a predicted pixel representation for a further pixel, said pixels forming a pixel set extending in both said dimensions,

selection means responsive to said at least three pixel representations for selecting, or not selecting, said further pixel for compression encoding,

comparing means for comparing said predicted representation of a selected pixel with an actual representation of said pixel from said first buffer means, to determine if said prediction is or is not correct,

run length encoding means responsive to said comparing means for encoding successive correct predictions and a following incorrect prediction as at least one multibit word, and second buffer means responsive to said run length encoding means and said predictor means for storing said at least one multibit word and at least one unencoded pixel representation corresponding to an unselected pixel.

4,325,086

RECORDING DEVICE

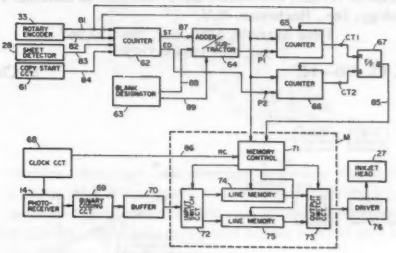
Yasushi Sato, Kawasaki; Seiji Saito, and Naoki Ayata, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 139,762

Claims priority, application Japan, Apr. 20, 1979, 54-48656; Jun. 14, 1979, 54-74797; Jun. 20, 1979, 54-77801; Jul. 13, 1979, 54-89111; Jul. 16, 1979, 54-91153

Int. Cl.[3] H04N *1/22*

U.S. Cl. 358—296 20 Claims



1. A recording device, comprising:

(a) image original mounting means for mounting an image original to be reproduced;

(b) information reading means to read image original information by scanning the image original on said image original mounting means by a moving member which moves relative to said image original mounting means;

(c) recording means to record the image original information read by said information reading means onto a recording medium;

(d) detecting means to detect a forward end position of the image original relative to the scanning direction of the image original by said information reading means, and to form a detection signal; and

(e) control means to control, in response to the detection signal formed by said detecting means, commencement of recording of said image original information onto said recording medium by said recording means.

4,325,087

MAGNETIC MARKER FOR LOCATING A SPLICE WITHIN MAGNETIC TAPE

Alfred H. Moris, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 29, 1980, Ser. No. 125,966

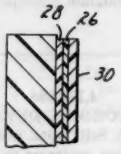
Int. Cl.[3] G11B *27/02, 5/02, 5/78*

U.S. Cl. 360—13 10 Claims

1. A marker adapted for locating a splice within an endless loop of magnetic tape said marker comprising

a magnetic layer having a residual flux density of at least 0.05 line of flux per centimeter of width, a thickness of not greater than 60 microns, and a coercivity of at least 1000 oersteds, such that said magnetic layer is capable of having recorded thereon a detectable magnetic pattern and the high coercivity of said magnetic layer enables said

pattern to resist erasure during conventional magnetic recording operations,



means for attaching said magnetic layer to the endless loop of magnetic tape at a predetermined position with respect to said splice.

4,325,088

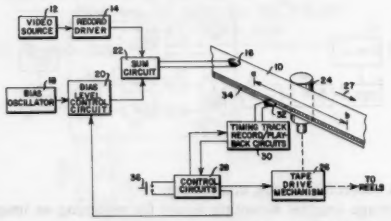
LAP AND DISSOLVE IN VIDEO CAMERAS WITH VTR

Charles E. Wright, Escondido, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Mar. 24, 1980, Ser. No. 132,967

Int. Cl.³ H04N 5/79

U.S. Cl. 360—14 **14 Claims**



1. A video camera comprising:

(a) reversible drive means for advancing a magnetic record member in either first or second directions along a predetermined path;

(b) record means for magnetically recording successive multi-picture scenes on a moving record member as such member advances past a recording position in a first direction, said record means comprising magnetic head means, means for producing video signals representing scene information, a source of AC bias, means for combining said video signals and said AC bias and for applying the combined signal to said magnetic head means; and

(c) means for producing a lap and dissolve effect between successive scenes as recorded, said lap and dissolve producing means comprising:

(1) means operatively coupled to said source of AC bias for gradually reducing the level of AC bias applied to said magnetic head means while recording the end portion of a first scene, thereby gradually reducing the sensible level of the recorded pictures comprising said end portion while the recording member advances a predetermined distance in said first direction past said recording position;

(2) control circuit means operatively coupled to said drive means for advancing the recording member said predetermined distance in said second direction to position the magnetic record member so that said end portion is located at a position upstream of said recording position; and

(3) means operatively coupled to said source of AC bias for gradually increasing the level of AC bias applied to said magnetic head means while said record member is again advanced in said first direction from its upstream position to record the beginning portion of a second scene, thereby gradually increasing the sensible level of the recorded pictures of the second scene while the sensible level of the recorded pictures of the first scene is gradually reduced.

4,325,089

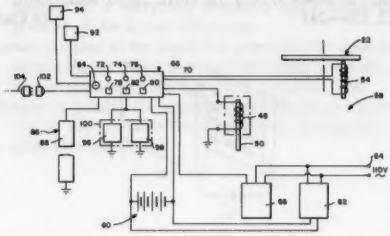
SYSTEM FOR SAFEGUARDING MAGNETICALLY RECORDED DATA

Da L. Hsu, 2203 Glen Ave., Berkeley, Calif. 94709

Filed Dec. 10, 1979, Ser. No. 102,231

Int. Cl.³ G11B 5/86, 15/04

U.S. Cl. 360—15 **2 Claims**



1. A system for safeguarding data which is magnetically stored on a medium including the combination of a housing, a support for holding the medium within the housing, magnetic means for establishing an electromagnetic field across at least a portion of the medium, means for producing a destruct signal responsive to unauthorized entry into or a given condition of the housing, and control means for energizing the magnetic means responsive to the destruct signal and for magnetically erasing the data on the medium, said support means including means for causing relative movement between the medium and the electromagnetic field, said support means comprising a turntable mounted for rotation about an axis in a plane extending through the field when the magnetic means is energized, said medium being mounted on the turntable for rotation therewith through the field including spring means for applying a force when stressed to the turntable for rotating the same about the axis, and operating means for releasing or holding the turntable against rotation in a stand-by mode while the spring means is stressed and for releasing the turntable in an operating mode responsive to the destruct signal for enabling the spring means to rotate the turntable.

4,325,090

DEVICE FOR SYNCHRONIZING A CLOCK PULSE GENERATOR WITH A SERIAL DATA SIGNAL

Miloslav Janak, Sunnyvale, Calif.; Martin Ginsberg, Daaden, and Albrecht Reiners, Siegen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,715

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906200

Int. Cl.³ G11B 5/09

U.S. Cl. 360—51 **5 Claims**

1. In a device for synchronizing a clock pulse generator with a serial bivalent signal received from an external medium, which signal comprises a number of successive bit cells of nominally equal duration and has at least one transition in each series of a predetermined, fixed number of directly successive bit cells comprising:

oscillator means, having a control input and a control clock output, for producing a control clock pulse train under the influence of a signal on the control input;

clock extraction means, having a read clock output, for producing a read clock pulse train from the received signal;

phase comparator means, having a first input and a second

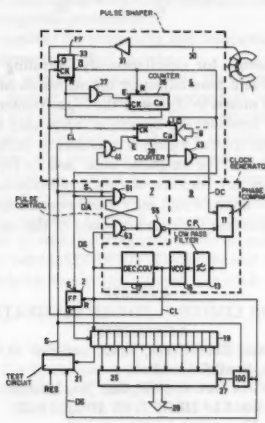
input, connected for receiving said control clock pulse train and said read clock pulse train, and an output for supplying a phase difference signal which characterizes the phase difference between said pulse trains; and

a low pass filter connected for receiving said phase difference signal and for forming therefrom a control signal which is connected to the control input of the oscillator means;

the improvement wherein said device further comprises:

test circuit means for determining whether or not the control clock pulse train is nominally synchronized with the received signal and for supplying a synchronization signal indicative thereof; and

switching means which place the device in a first state by (1) causing the clock extraction means to produce a read clock pulse train which undergoes transitions at one-half bit cell intervals and connecting said read clock pulse train to the first input of the phase comparator means, causing the oscillator means to produce a control clock pulse train



having twice the nominal bit cell frequency and connecting said control clock pulse train to the second input of the phase comparator means, and adjusting the low pass filter to a first cut-off frequency, when the synchronization signal indicates a lack of nominal synchronization between the control clock pulse train and the received signal; and which place the device in a second state by (2) causing the clock extraction means to produce a read clock pulse train which undergoes transitions at one bit cell intervals and connecting said read clock pulse train to the first input of the phase comparator means, causing the oscillator means to produce a control clock pulse train at the nominal bit cell frequency and connecting said control clock pulse train to the second input of the phase comparator means, and adjusting the low pass filter to a second cut-off frequency, which is lower than the first cut-off frequency, when the synchronization signal indicates that the control clock pulse train and the received signal are nominally synchronized.

4,325,091

CASSETTE TAPE RECORDER

Yoshitsugu Uchida, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

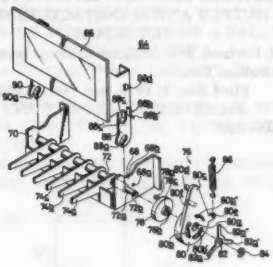
Filed Jan. 30, 1980, Ser. No. 116,864
Claims priority, application Japan, Jan. 31, 1979, 54-11197[U]
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—96.6 **12 Claims**

1. A cassette tape recorder having a housing with an opening therein, and including:

a shaft extending between spaced parallel brackets mounted on said housing adjacent to said opening;

a cassette holder for holding therein a tape cassette and having a pair of arms pivotally mounted on said shaft to rotate thereabout between a loading position in which said holder is outside said opening for loading and unloading of said cassette, and an operative position in which said holder is inside said opening;

a slip-friction member axially slidably mounted on said shaft and engaged loosely with one said holder arm for unitary



rotation therewith and having a surface for making contact with a stationary surface when said slip-friction member axially slides toward said stationary surface;

first biasing means for urging said holder toward said loading position; and

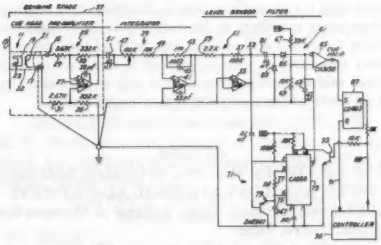
second biasing means for urging said slip-friction member toward said stationary surface to produce slip friction between said contacting surfaces when said holder is rotated from said operative position to said loading position by the action of said first biasing means.

4,325,092

APPARATUS FOR DETECTION OF CUE DATA CARRIED BY A RECORDING MEDIUM MOVING AT GREATLY VARYING SPEEDS

David O. Neathery, Wheaton, and Edward J. Riggs, West Chicago, both of Ill., assignors to King Instrument Corporation, Westboro, Mass.

Filed Jul. 18, 1980, Ser. No. 170,016
Int. Cl.³ G11B *5/25, 5/02*
U.S. Cl. 360—119 **26 Claims**



1. A cue detector for sensing cue data recorded together with other informational data on a recording medium where the cue data has a fixed wavelength lambda longer than the wavelength of the other informational data and the recording medium is moved at varying speeds, said cue detector comprising:

sensing means positioned in sensing relation to said recording medium and tuned for providing an output signal

having the greatest amplitude when reading data of lambda wavelengths;

integrator means for receiving said output signal and responsively generating an integral signal representative of the integral of said output signal; and

level sensor means for comparing the amplitude of the integral signal with respect to a reference amplitude and responsively generating a cue detection signal for indicating detection of said cue data by said sensing means.

4,325,093

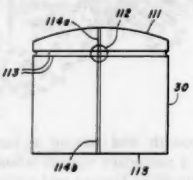
MAGNETIC HEAD TRANSDUCER HAVING ENHANCED SIGNAL OUTPUT AND MANUFACTURING METHOD THEREFOR

Kaoru Ishii, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,352

Int. Cl.³ G11B *5/12, 5/251, 5/42*

U.S. Cl. 360—120 **14 Claims**



1. A method of manufacturing a magnetic head transducer having a transducing gap of predetermined width along the entire length thereof, comprising the steps of:

(a) providing a pair of transducer members comprised of a magnetic material and each member having an opposing major surface, at least a portion of each major surface defining first and second gap faces forming first and second gaps;

(b) disposing non-magnetic material on at least one of said first gap faces at a thickness equal to the predetermined gap width, a first portion of said gap being formed when said transducer members are placed in abutting relationship;

(c) disposing on at least one of said second gap faces a brazing alloy at a thickness of at least five percent greater than the thickness of said non-magnetic material, a second portion of said gap being formed when said transducer members are placed in abutting relationship; and

(d) holding said transducer members together so that said opposing major surfaces are in abutment and heating said transducer members to the melting point of said brazing alloy to secure said second gap faces of transducer members together, a portion of said brazing alloy escaping from said second portion of said gap so that said gap has a uniform width along the entire length thereof.

4,325,094

TAPE RECORDER HAVING INTERLOCKED TAPE SPEED AND TONE CONTROL ADJUSTMENT

Hiroki Ichikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,435

Claims priority, application Japan, Feb. 26, 1980, 55-21537

Int. Cl.³ G11B *5/00, 19/00*

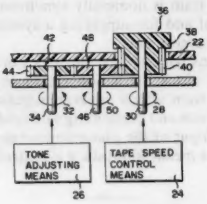
U.S. Cl. 360—137 **8 Claims**

1. In a tape recorder having a knob operated tape speed control means for changing the running speed of a magnetic tape during a recording and/or reproducing operation by the movement of said knob,

the improvement comprising the combination of:

a tone adjusting means having control means for changing the high frequency response of sound reproduced from the magnetic tape during a reproducing operation by the movement of said control means of said tone adjusting means; and

a control mechanism mechanically coupled to said knob of said tape speed control means and to said control means of said tone adjusting means, said control mechanism being responsive to operation of said knob of said tape speed



control means for simultaneously operating said control means of said tone adjusting means for causing said tone adjusting means to (i) lower the high frequency response during a reproducing operation when said knob of said tape speed control means is operated to increase the running speed of the magnetic tape, and to (ii) elevate the high frequency response during a reproducing operation when said knob of said tape speed control means is operated to decrease the running speed of the magnetic tape.

4,325,095

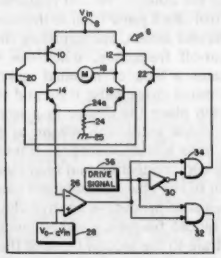
MEANS FOR LIMITING POWER DISSIPATED IN AN A.C. MOTOR

Russell F. Hart, Blue Grass, Iowa, assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 8, 1980, Ser. No. 195,029

Int. Cl.³ H02H *7/08*; H02P *13/20*

U.S. Cl. 361—23 **8 Claims**



1. In an inverter circuit responsive to a varying D.C. voltage for delivering current in alternating half cycles to an A.C. motor, means for limiting the power delivered to said motor comprising:

means for generating a first voltage level related to the current through said motor,

a voltage source for impressing a D.C. voltage across said inverter circuit;

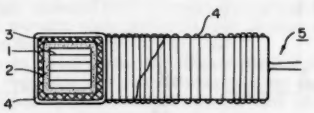
means for generating a second voltage level equal to a constant voltage minus fixed percentage of said D.C. voltage; and,

means comparing said first voltage level with said second voltage level for limiting the current delivered to said A.C. motor.

4,325,096
ZERO-PHASE CURRENT TRANSFORMER

Mineo Sunohara; Yasuhiko Okubo, both of Sagamihara; Mitsugu Taketa, Itami; Yoshiyuki Nakai, Itami, and Yukio Miyazaki, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 108,245
Claims priority, application Japan, Dec. 29, 1978, 53/164282
Int. Cl.[3] H02H *3/28;* H01F *40/06*
U.S. Cl. 361—45 2 Claims

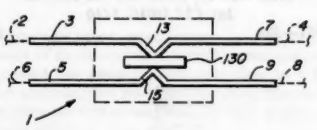


1. A zero-phase current transformer comprising:
a magnetic core comprising a first magnetic material having a high magnetic permeability;
a damper member for protecting said magnetic core from an impact directly applied thereto;
a secondary winding wound around the peripheral surface of said damper member, said secondary winding being coupled to a relay means operable in response to an output of said secondary winding above a predetermined level;
casing means for protecting said magnetic core from an inward pressure caused by said secondary winding, at least a portion of said casing means comprising a second magnetic material having a magnetic permeability lower than that of said first magnetic material; and
a load lead wire magnetically coupled to said magnetic core for supplying an electric current to a load.

4,325,097
FOUR TERMINAL PULSE SUPPRESSOR

O. Melville Clark, Tempe, Ariz., assignor to General Semiconductor Industries, Inc., Tempe, Ariz.

Filed Sep. 17, 1979, Ser. No. 75,961
Int. Cl.[3] H02H *9/04*
U.S. Cl. 361—56 3 Claims

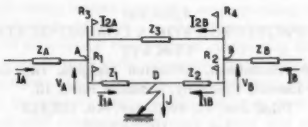


1. A surge suppressor for limiting high-speed, high voltage power surges conducted between first and second electrical lines, said surge suppressor comprising in combination:
a. a package, said package having a cavity therein;
b. a semiconductor junction device that operates in a junction avalanche mode, said semiconductor junction device being disposed in said package, said semiconductor junction device having first and second electrodes;
c. first and second terminals located outside of said package;
d. a first conductor for conducting substantially all line current through said first line, said first conductor extending through the interior of said package, said first conductor having a first substantially V-shaped intermediate portion disposed inside said package, said first substantially V-shaped intermediate portion having a central tip portion attached to and electrically connected to said first electrode of said semiconductor junction device, said first substantially V-shaped intermediate portion having two opposed end portions electrically connected to said first and second terminals, respectively;
e. third and fourth terminals located outside of said package; and
f. a second conductor for conducting substantially all line current flowing through said second conductor, said second conductor extending through the interior of said package, said second conductor having a second intermediate portion disposed inside said package and attached to and electrically connected to said second electrode of said semiconductor junction device, said second conductor having two opposed end portions electrically connected to said third and fourth terminals, respectively.

4,325,098
DETECTION OF THE POSITION OF A FAULT ON AN ELECTRIC LINK

Isabelle Heller, Meudon, France, assignor to Enertec, Montrouge, France

PCT No. PCT/FR79/00015, § 371 Date Oct. 23, 1979, § 102(e) Date Oct. 22, 1979, PCT Pub. No. WO79/00657, PCT Pub. Date Sep. 6, 1979
PCT Filed Feb. 19, 1979, Ser. No. 165,483
Claims priority, application France, Feb. 23, 1978, 78 05205
Int. Cl.[3] H02H *7/26*
U.S. Cl. 361—82 8 Claims



1. A method for detecting the location of a fault occurring on an electric link, the link comprising two parallel lines each having respective ends extending between a first and a second point of this link, and each line including a compensating capacitor in series between its ends, said method comprising the steps of:
(a) detecting at each end of each line the apparent forward or backward direction of a fault on the electric link;
(b) generating, at each end of each line, a first signal indicative of a detected forward fault and a second signal indicative of a detected backward fault; and
(c) generating a signal indicative of the presence of a fault on a first of the two lines when a forward fault signal is generated at both ends of said first line, and wherein:
(d) said signal indicative of a fault on said first of the two lines is also generated when a forward fault signal is generated at the first end of said first line and a backward fault signal is generated at the second end of this first line, provided that a backward fault signal is generated at the first end of said second line.

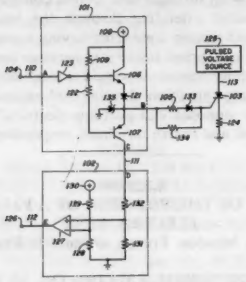
4,325,099
DETECTOR CIRCUIT FOR THYRISTORS

James E. Morehouse, and Richard A. Pedersen, both of New Tripoli, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 9, 1980, Ser. No. 195,334
Int. Cl.[3] G01R *19/165*
U.S. Cl. 361—93 10 Claims

1. An electrical circuit comprising
a thyristor (103) having an anode, a cathode, and a gate terminal and being switchable to a low impedance state in response to a control signal in a first state applied to said gate terminal, wherein a first and a second current are permitted to flow simultaneously out of said gate and said cathode terminals, respectively, when said thyristor is in said low impedance state,
characterized in that said electrical circuit further comprises

detector circuit means (102) coupled to said gate terminal for detecting said first current and for generating an output signal indicating the presence of said second current, when said first current is greater than a predetermined magnitude.

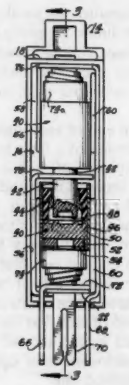


4,325,100

LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jun. 12, 1980, Ser. No. 158,913
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—119 **9 Claims**



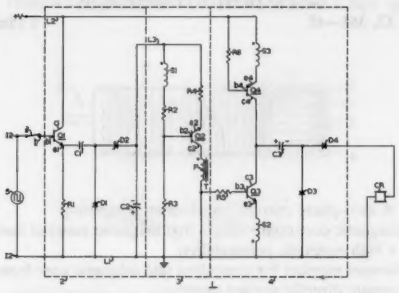
1. A line protector for a communications circuit comprising a dielectric elongated housing open at one side for receiving the components of the protector, said housing having means interior thereof for supporting first and second surge voltage arresters in substantially coaxial relationship with the longitudinal axis of the housing, a first line terminal electrically connected to one arrester, a second line terminal electrically connected to the other arrester, the first line terminal extending from one end of the housing the full length of both arresters and to the other end of the housing, the second line terminal being substantially at said other end of the housing, a ground terminal connected to both arresters intermediate the ends of the housing and extending along only one of the two arresters to said other end of the housing, pins on each of said terminals projecting from said other housing end through slots thereat, and a cover over said opening and having means to retain said components in said housing.

4,325,101

VITAL ELECTRONIC TIME DELAY CIRCUIT

Reed H. Grundy, Murrysville, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Dec. 26, 1979, Ser. No. 106,971
Int. Cl.³ H01H *47/00*; B61L *21/06*
U.S. Cl. 361—195 **10 Claims**



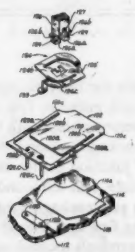
1. A vital electronic time delay circuit comprising, a source of periodic signals, a switch connected between said source of periodic signals and an input amplifier, said input amplifier amplifies said periodic input signals when said switch is closed, a rectifier for rectifying the amplified periodic input signals and for charging a potential storage means, an oscillator powered by the potential charge on said storage means for producing a.c. oscillations, a pair of switching transistors alternately rendered conductive by opposite alternations of said a.c. oscillations, a capacitor-diode network coupled to said pair of switching transistors for normally causing the energization of a vital relay and for causing the de-energization of said vital relay a predetermined period of time after the source of the periodic signals is disconnected from the circuit by the opening of said switch.

4,325,102

VARIABLE CAPACITOR FOR USE IN A KEYBOARD

George P. English, Hayden Lake, Id., assignor to General Instrument Corporation, Clifton, N.J.

Filed Oct. 10, 1980, Ser. No. 195,743
Int. Cl.³ H01G *5/16*
U.S. Cl. 361—288 **11 Claims**



1. A variable capacitor for use in a keyboard, comprising:
a stationary capacitor plate of thin conductive sheet material on an insulative substrate and having a substantially planar face;
a movable member formed from a piece of thin, conductive, sheet material and including a movable capacitor plate having a substantially planar continuous face in overlying, spaced apart relation to said face of said stationary capacitor plate;
said movable plate being struck from the body of said sheet

material to provide a pair of free side edges and an outer free edge transverse thereto, a portion opposite said outer free edge projecting laterally outward of said free side edges and integral with a pair of supporting spring-like deflectable legs disposed on opposite sides of said free side edges and sloping downwardly toward said substrate to join an integral base strip spaced below and parallel of said outer free edge and adapted for mounting on said substrate to support said movable plate above said stationary plate for movement toward and away from the same to vary the capacity therebetween;

a plunger mounted for movement toward and away from said movable plate supporting said element and biased away from said movable plate, and

a separate, spring washer-like element attached to a plunger and engagable with said movable plate and movable in a direction normal to said substrate forcing said movable plate toward said stationary plate into a maximum capacity position wherein said plates are fully engaged, said spring washer-like element having means providing a substantially linear force characteristic on said plunger during continued movement thereof toward said fixed plate after said maximum capacity position is obtained.

4,325,103
PROVISIONAL FIXING STRUCTURE OF ELECTRONIC TUNER

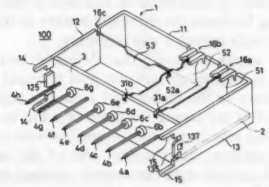
Katsuo Ito, Kanazawa, and Kazunori Yoshimura, Nonoichi, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 13, 1979, Ser. No. 103,168

Claims priority, application Japan, Dec. 28, 1978, 53-182913[U]

Int. Cl.³ H05K *7/14, 1/08*

U.S. Cl. 361—424 **10 Claims**



1. An electronic tuner, comprising:

a frame made of an electrically conductive material and having an elongated flat plate portion extending in a horizontal direction and side plate portions extending from both ends of said flat plate portion at substantially right angles and parallel to each other;

a main base plate fixed to said frame and having opposite main surfaces, one main surface of said main base plate having a printed pattern for a predetermined electronic circuit on said main base plate, said main base plate having a first plurality of apertures formed therein near one side edge of said main base plate;

an auxiliary base plate connected to the distal end of each of said side plate portions of said frame such that said auxiliary base plate is adjacent said one side edge of said main base plate and said frame, said main base plate and said auxiliary base plate cooperate to define an interior space therebetween, said auxiliary base plate having opposite main surfaces, one main surface of said auxiliary base plate facing said space, the opposite main surface of said auxiliary base plate having an electrically conductive film formed on substantially the whole surface thereof, said auxiliary base plate being provided with a second plurality of apertures equal in number to the number of said first plurality of apertures, each of said apertures of said second plurality of apertures corresponding to a different said aperture of said first plurality of apertures in said main base plate such that each aperture of said first set of apertures forms a set with its corresponding aperture of said second set of apertures;

a plurality of connection terminals equal in number of the number of said first and second pluralities of apertures, each of said connection terminals corresponding to a different said set of apertures, a first end terminal of each of said connection terminals extending through its corresponding one of said first plurality of apertures in said main base plate, a second end terminal of each of said connection terminals extending through the corresponding one of said second plurality of apertures of said auxiliary base plate to said opposite main surface side of said auxiliary base plate;

a shield plate having opposite ends supported by said frame and said auxiliary base plate, respectively, for shielding said electronic circuit formed on said main base plate;

first provisional fixing means for provisionally fixing said main base plate in such a position that said main surface of said main base plate which is opposed to said main surface of said main base plate having said electronic circuit formed thereon faces said space;

second provisional fixing means for provisionally fixing said auxiliary base plate to said distal end of said side plate portions of said frame with said first end terminal of each of said connection terminals being inserted into the corresponding one of said first plurality of apertures of said main base plate and said second end terminal of each of said connection terminals being inserted into the corresponding one of said second plurality of apertures of said auxiliary base plate;

said second provisional fixing means comprising first engagement means formed at the respective distal ends of said side plate portions of said frame, and second engagement means formed at opposite ends of said auxiliary base plate and engaged with corresponding ones of said first engagement means formed on said side plate portions;

said side plate portions of said frame cooperating with said flat plate portion of said frame such that said side plate portions are elastic in a direction parallel to said flat plate portion such that said side plate portions hold said second engagement means, thereby to provisionally fix said frame, said main base plate, said auxiliary base plate, said plurality of connection terminals and said shield plate in a united state; and

solder means for permanently affixing said auxiliary base plate to said frame.

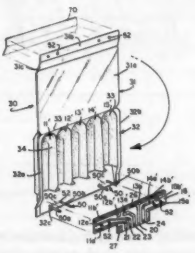
4,325,104
MULTILAMP PHOTOFLASH UNIT WITH FUNCTIONAL LABEL

David R. Broadt, Lewisburg, Pa., and Emergy G. Audesse, Beverly, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 27, 1980, Ser. No. 181,932

Int. Cl.³ G03B *15/02*

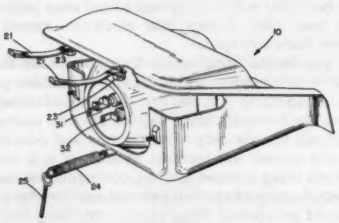
U.S. Cl. 362—11 **15 Claims**



1. A multilamp photoflash unit comprising, in combination, a housing means having a light-transmitting front portion, a plurality of flashlamps enclosed in said housing means, termi-

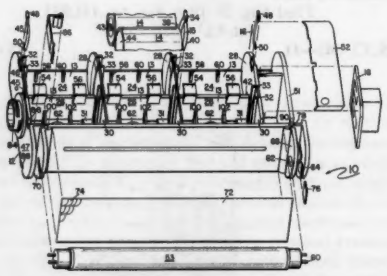
nal means joined to said housing means and coupled to said lamps for enabling flashing of the lamps in response to flash actuation signals applied to said terminal means, and a label comprising an adhesive backed sheet of substantially opaque material affixed to the exterior of said housing means and disposed to cover a section of said light-transmitting front portion of the housing means for providing selective shielding of the light radiated from said flashing lamps.

4,325,105
HEADLIGHT ASSEMBLY
Don R. Scimonelli, 14363 Saguaro Pl., Centreville, Va. 22020
Filed Aug. 24, 1979, Ser. No. 69,530
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—80 **7 Claims**



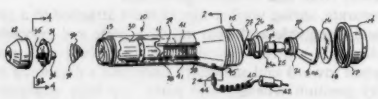
1. A headlight assembly for replacement of a conventional flip-up type headlight assembly for an automobile comprising:
- a housing including a recessed entry portion and a bucket portion;
- said bucket portion being adapted to adjustably position a headlight; and
- a flange member extending around a peripheral surface of said recessed entry portion and said bucket portion;
- said flange member being shaped to be contiguous with said automobile frame.

4,325,106
ONE PIECE BATTERY HOLDER
William Bartunek, Yonkers; Gordon E. Kaye, Garrison, both of N.Y., and Henry R. Mallory, Greenwich, Conn., assignors to Duracell International Inc., Bethel, Conn.
Filed Sep. 10, 1979, Ser. No. 74,219
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—157 **12 Claims**



1. A battery holder comprising a drawer having a plurality of abutting compartments, each compartment being separated from the others by walls which isolate each compartment from each next adjacent compartment, and each compartment being sized to accommodate a single battery therewithin, whereby said walls maintain the battery in each compartment in out-of-contact relationship with the batteries in the other compartments, and each compartment being polarized so that a battery can be placed therein only in a predetermined position; means for electrically interconnecting the battery compartments; and means for connecting a user circuit to the battery holder.

4,325,107
RECHARGEABLE FLASHLIGHT
Richard H. MacLeod, 15919 State Rte. 2, Waseon, Ohio 43567
Filed Jan. 29, 1980, Ser. No. 116,620
Int. Cl.³ F21L *9/00, 7/00*
U.S. Cl. 362—183 **13 Claims**



1. A rechargeable flashlight comprising in combination a tubular casing of dielectric material for receiving therein at least one rechargeable battery,
- said casing having a rear end portion threaded for screw engagement with an end cap and a forward end portion threaded for screw engagement to a light bulb and reflector cap assembly,
- a metal sleeve attached to the inner surface of the casing adjacent to said first mentioned threaded portion,
- said sleeve having a flange overlapping the end of the casing and an inwardly formed indentation providing a slot between the sleeve and the inner surface of the casing for receiving and making electrical contact with one end of a current carrying bus bar,
- a cross member of rigid material attached to the inner wall of the casing between the foremost battery in the casing and the light bulb reflector cap assembly,
- said cross member having an electrical terminal therethrough in alignment with the post terminal of the foremost battery in the casing and a cut-out adjacent to the inner wall of the casing for entry of a bus bar,
- a metal spring attached to the terminal on said cross member in such manner that the free end of the spring makes electrical contact with the central terminal in the base of a light bulb,
- a rear end cap of dielectric material having interior threads engageable with the threaded rear end section of the casing and an interior annular shoulder,
- a cup positioned in said rear end cap and having an exterior rim flange bearing against the annular shoulder of the rear end cap,
- a conical metal spring having its base nestled in said cup with a terminal bend in the end of the outermost coil for making contact with said metal sleeve flange and its apex positioned against the bottom terminal of the rearmost battery in the casing,
- a current carrying bus bar positioned against the interior surface of the casing and extending from the indentation in the metal sleeve, through the cut-out in the casing's cross member and to a threaded metal cup bulb retainer in a light bulb reflector cap assembly,
- means exterior of the casing for moving said bus bar fore and aft to respectively make and break electrical contact with said bulb retainer,
- a light bulb and reflector cap assembly comprising an internally threaded bezel of dielectric material, a lens, a reflector having an externally threaded tubular neck extension and an interior shoulder in said neck extension, a flanged light bulb and a metal cup bulb retainer with internal threads for engagement with the threads on the reflector's neck extension for screwing the flange surface of the light bulb against the interior shoulder in said neck extension, said threaded metal cup having a central aperture in its base

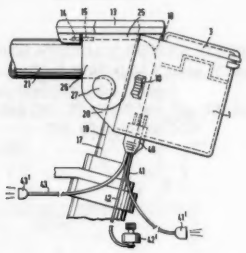
whereby the central terminal and its surrounding dielectric insulation at the base of the light bulb protrudes therethrough to make electrical contact with the metal spring attached to the terminal in the cross member, and

a phono-jack affixed to the tubular casing for accepting a phono plug attached to a D.C. charging source for recharging the batteries in the casing, said phono-jack having one electrical lead therefrom attached to the metal bus bar and its other electrical lead attached to the electrical terminal on the cross member of the tubular casing.

4,325,108
RECHARGEABLE BATTERY UNIT FOR BICYCLE ILLUMINATION

Werner Spingler, Badenweiler, Fed. Rep. of Germany, assignor to ESGE-Marby GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,026
Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919211
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—183 **16 Claims**



1. For attachment to a bicycle having a generator (42) and electrical illuminating means (41, 43), a selectively removable re-chargeable battery unit (4), having

a transfer switch (10) for selective connection of the illuminating means to the generator (42) or to the battery unit (4);

a housing (1);

means to attach the housing on the frame of the bicycle in a predetermined position, said housing having a wall (3) which, upon such attachment, becomes a top wall,

wherein

the housing (1) is a unitary element and defines a battery chamber (2);

the battery (4) is retained in the chamber in the housing;

the transfer switch (10) is secured to the housing and externally accessible therefrom;

a battery-charge indicator (11) is provided, connectable to said battery and providing an indication of the charge state thereof;

and a lamp circuit indicator (12) is provided, connected to the illuminating means and providing an indication of proper functioning thereof,

said indicators (11, 12) being arranged on the housing to be visible by the user when looking towards said top wall, whereby the releasable attachable housing forms a unitary support for the indicators;

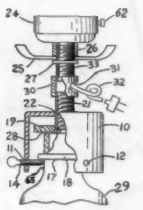
and the attachment means comprise

means for attachment of the housing engageable with the handle bar post or stem (17) of the bicycle.

4,325,109
LAMP CONVERSION UNIT

Bakari Mwanyoha, New Bedford, Mass., assignor to NU Industries, Inc., New Bedford, Mass.

Filed Jun. 27, 1975, Ser. No. 591,001
Int. Cl.³ F21V *19/00*
U.S. Cl. 362—412 **3 Claims**



1. A lamp conversion unit for converting a standard such as a bottle or a vase into a lamp, said standard having a neck with a spaced shoulder, and said lamp conversion unit mounted on the outside of said neck of the standard, said lamp conversion unit comprising,

(a) a lamp socket;

(b) a threaded lamp pipe for supporting said lamp socket at the upper end of said lamp pipe;

(c) a harp base mounted below said lamp socket and said harp base being secured against said lamp socket by a retaining nut;

(d) an inverted cup over said neck of the standard, said cup having a threaded opening in the center of its upper base portion for receiving the lower end portion of said supporting lamp pipe, said cup having at least three threaded openings at its bottom portion, said threaded openings being equidistant from each other around the circumference of said cup, and said threaded openings receiving engaging screws for engagement on the bottom of said spaced shoulder on the neck of the standard for preventing removal of said inverted cup from said neck of the standard;

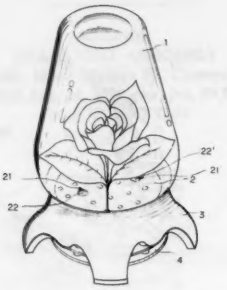
(e) a press-plate having a threaded opening in its central portion for receiving the lower end portion of said supporting lamp pipe and said press-plate having a smaller unthreaded opening of a smaller diameter below said threaded opening, said smaller opening providing a locking position between said supporting lamp pipe and said threaded opening on the press-plate said press-plate resting on top of said neck of the standard,

whereby said press-plate applying a downward engagement force against the top of said neck, said engagement force provided by relative rotation between said supporting lamp pipe and said inverted cup thus driving said supporting lamp pipe axially downward and said relative rotation simultaneously forcing said engaging screws upward, said screws applying engagement force against the bottom of said spaced shoulder on the neck of the standard, said engagement force between said press-plate and said engaging screws increasing as said supporting lamp pipe is driven further downward through the base of said inverted cup for providing the required engagement force between said inverted cup and the standard.

4,325,110
VASE-TYPE ILLUMINATIVE DEVICE

Woei S. Tang, 2F1., No. 1-1, Lane 129, Sec. 2 Chang-An East Rd., Taipei, Taiwan

Filed Mar. 13, 1980, Ser. No. 130,008
Int. Cl.³ F21P 1/02
U.S. Cl. 362—806 15 Claims



1. One kind of improved vase-type illuminative device comprising such component parts as transparent container, transparent base board, supporting stand and illuminating mechanism, and is characterized by that both the said transparent container and the transparent base board thereunder can be either fixed or movably mounted together, while the transparent base board is provided with a single or a plurality of holding holes for securing flowers and ornaments, and water inlets equipped with stoppers or threaded covers to close the opening of water inlet.

4,325,111
SWITCHED MODE REGULATED DC TO DC CONVERTER

Virgilio Quiogue, Northville, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1980, Ser. No. 136,744
Int. Cl.³ H02M 3/335
U.S. Cl. 363—17 1 Claim

1. A switched mode regulated DC to DC converter for supplying a regulated voltage to a load comprising:

a switching frequency generator for generating a switching cycle having positive and negative portions;

means, responsive to the output of the switching frequency generator, for accumulating a voltage during the positive and negative portions of the switching cycle;

means for sensing load voltage demand;

means for generating a first and second trigger output during the respective positive and negative portion of the switching cycle when the accumulated voltage equals the sensed load voltage demand, the time required to generate the second trigger output being equal to the time required to generate the first trigger output;

transformer means, coupled to the means for accumulating, for generating currents of positive and negative polarity during the positive and negative portions of the switching cycle;

a load voltage source;

first switching means, responsive to the generated currents of positive polarity, for driving the transformer means during the positive portion of the switching cycle; and

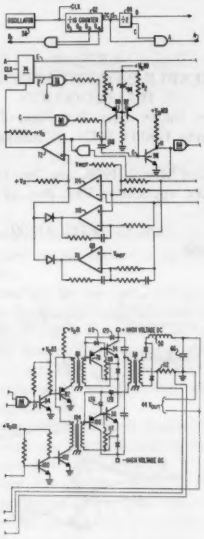
second switching means, responsive to the generated currents of negative polarity, for driving the transformer means during the negative portion of the switching cycle;

wherein the means for generating a first and second trigger output during the positive portion of the switching cycle when the accumulated voltage equals the sensed load voltage demand, the time required to generate the second trigger output being equal to the time required to generate the first trigger output comprises:

a supply voltage source;

a pair of matched transistors biased by the supply voltage source;

a capacitor electrically connected to the supply voltage source through the matched transistors to store voltage during the positive and negative portions of the switching cycle, a third transistor, responsive to outputs from the matched transistors, for coupling the capacitor between a first of the matched transistors and ground during the positive portion of the switching cycle, the third transistor



coupling the capacitor to a second of the matched transistors during the negative portion of the switching cycle;

means, responsive to the switching frequency generator, for directing current to the capacitor during the positive portion of the switching cycle, the means, responsive to the switching frequency generator, for directing current from the capacitor to ground during the negative portion of the switching cycle;

an operational amplifier to transmit the sensed load voltage demand; and

a comparator to compare the stored accumulated voltage on the capacitor and the transmitted portion of the load from the operational amplifier.

4,325,112
COUNTER CONTROLLED PULSE WIDTH MODULATED INVERTER

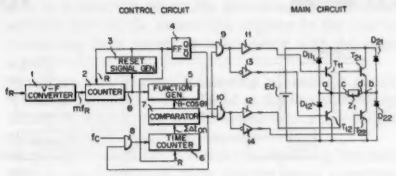
Kenichi Otsuka, Kodaira, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 5, 1981, Ser. No. 222,626
Claims priority, application Japan, Jan. 25, 1980, 55-7517
Int. Cl.³ H02M 7/537
U.S. Cl. 363—42 7 Claims

1. A voltage source inverter having a main circuit with switching means connected through a load between buses of a DC power source, and a control circuit controlling the on-off operation of said switching means for outputting, by pulse width modulation, an AC voltage having a desired frequency and a desired waveform between said load terminals, wherein said control circuit comprises:

a function generator for outputting a first signal proportional to the voltage-time-integration value of said AC voltage waveform in correspondence with the electrical angle of said AC voltage waveform;

a time counter for outputting a second signal representative of the integrated time of the ON period of said switching means;



a comparator for comparing said first signal with said second signal at each predetermined time; and

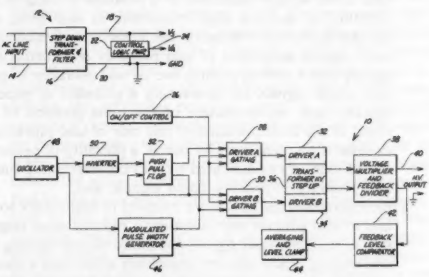
a logic circuit for controlling the on-off operation of said switching means in response to the output of said comparator.

4,325,113

HIGH VOLTAGE POWER SUPPLY

Robert J. Tomlie, Jr., Brookfield Center, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 27, 1980, Ser. No. 200,663
Int. Cl.³ H02M *3/18*
U.S. Cl. 363—60 **6 Claims**



1. A high voltage power supply for supplying voltage to a load, comprising:

means for receiving a line voltage;

means for converting the line voltage to a square wave form;

a step-up transformer having primary and secondary windings;

means for supplying the square wave form to the primary winding of said transformer;

means for receiving and multiplying the voltage from said secondary winding;

means for dividing the voltage from said voltage multiplying means into first and second portions;

means for supplying said first portion to the load;

means for comparing the voltage level of said second portion to a fixed voltage, including means for adjusting the voltage level of said second portion in response to said comparison; and

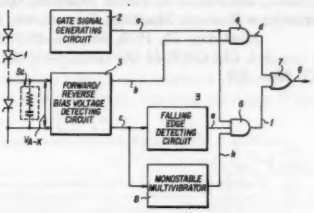
means for providing said compared voltage of said second portion to said converting means to control the voltage level of the square wave form being supplied to the primary of the transformer.

4,325,114

GATE CONTROLLING CIRCUIT FOR A THYRISTOR CONVERTER

Sumio Kobayashi, Yokohama; Tadashi Takahashi, Kawasaki, and Hidetoshi Ino, Kunitachi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 19, 1980, Ser. No. 131,661
Claims priority, application Japan, Apr. 24, 1979, 54/50656
Int. Cl.³ H02M *7/00*; H03K *17/72*
U.S. Cl. 363—68 **6 Claims**


GATE SIGNAL GENERATING CIRCUIT
FORWARD/ REVERSE BIAS VOLTAGE DETECTING CIRCUIT
FALLING EDGE DETECTING CIRCUIT
MONOSTABLE MULTIVIBRATOR

1. A gate controlling circuit for a thyristor converter having a plurality of thyristor arms, each thyristor arm including a plurality of thyristors in series, said circuit comprising:

first generating means for generating a gate pulse in response to a signal which is generated when a forward bias voltage is detected in one of said thyristor arms during a conductive period of the thyristor arm;

second generating means for generating a gate pulse in response to an output which is generated when a reverse bias voltage detected in the thyristor arm drops during a conductive period of the thyristor arm; and

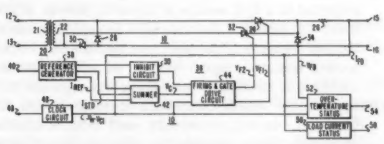
means for inhibiting the output of the second generating means when the period of the reverse bias voltage in the thyristor arm exceeds a predetermined time period.

4,325,115

REGULATED DC POWER SUPPLY

Frederick O. Johnson, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1980, Ser. No. 171,588
Int. Cl.³ H02M *7/155*
U.S. Cl. 363—81 **17 Claims**



1. A regulated DC power supply producing adjustable levels of a DC load current, comprising:

a pair of input terminals adapted for connection to a source of AC current;

a pair of output terminals adapted for connection to a load;

a converter connected between said input and said output terminals, said converter having a plurality of switches rectifying said AC current, said converter producing a current feedback signal;

means producing a plurality of adjustable reference signals each representative of one value of the load current, said means producing a predetermined standby reference signal representative of a standby load current;

means for adding said predetermined standby reference signal, one of said adjustable reference signals, and said current feedback signal, said adding means producing a control signal responsive to said addition;

firing means producing firing signals regulating the conduction of said swtiches, said firing signals responsive to said control signal; and

means inhibiting said firing signals from regulating the conduction of said switches when all of said adjustable reference signals have a value of zero for a predetermined period of time.

4,325,116

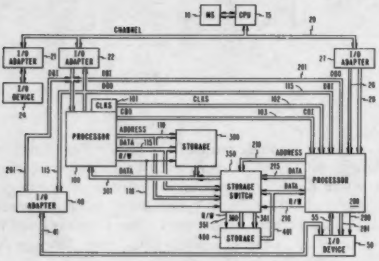
PARALLEL STORAGE ACCESS BY MULTIPROCESSORS

Roger H. Kranz; Edwin J. de Araujo Pinheiro, both of Rochester, Minn., and James A. Tuttle, Marietta, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1979, Ser. No. 68,372

Int. Cl.³ G06F *13/00*; G11C *8/00, 9/00*

U.S. Cl. 364—200 **5 Claims**



1. The combination of a first processor, a second processor and a storage having first and second segments where said first and second processors and said storage operate at the same cycle rate, and where the first processor can address said first and second segments and said second processor can address only said second segment of storage, said first processor having priority over said second processor for addressing said second segment of storage, the improvement comprising:

means connected to receive addresses from said first processor and apply said received addresses to said first segment of storage,

address selection means connected to receive addresses from said first and second processors and having an output for addressing said second segment of storage;

said address selection means being selectively operable in response to a first selection signal to pass an address presented by said first and not said second processor to said second segment of storage, and operable in response to a second selection signal to pass an address presented by said second processor to said second segment storage;

data selection means connected to receive data from said first and second processors, said data selection means being selectively operable in response to a first selection signal to pass data presented by said first processor to said second segment of storage and operable in response to a second selection signal to pass data presented by said second processor to said second segment of storage;

address decode means connected to receive an address from said first processor and generate a first selection signal when said address from said first processor is in a range to address said second segment of storage, and generate a second selection signal when said address from said first processor is outside the range to address said second segment of storage; and

means for applying said first and second selection signals to said address selection and data selection means to render the same operable whereby said second processor with the presence of said second selection signal is able to address said second segment of storage simultaneously with the addressing of said first segment of storage by said first processor.

4,325,117

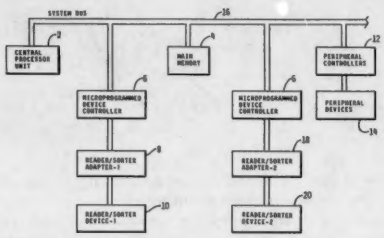
APPARATUS FOR CALCULATING A CHECK DIGIT FOR A STREAM OF DATA READ FROM A DOCUMENT

Arthur A. Parmet, Burlington, and Charles W. Dawson, East Bridgewater, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 31, 1979, Ser. No. 108,603

Int. Cl.³ G06F *11/08*

U.S. Cl. 364—200 **8 Claims**



1. A document processing system comprising:

a reader sorter for reading characters sequentially from a document and generating character signals indicative of a starting character of a field, a closing character of said field, and a plurality of numeric characters within said field, said plurality of numeric characters including a check digit character and a plurality of decimal digit characters;

an adapter coupled to said reader sorter and responsive to said character signals representative of said plurality of decimal digit characters for generating a plurality of position count signals indicative of a position of each of said plurality of decimal digit characters in said field, said adapter including a memory unit responsive to said character signals indicative of said plurality of decimal digit signals and a corresponding one of said plurality of position count signals for generating a plurality of product signals, each representative of the units position of the result of the multiplication of said one of said plurality of decimal digit characters by one of a plurality of predetermined numbers as indicated by said corresponding one of said plurality of position count signals; and,

a microprogrammed controller coupled to said reader sorter and to said adapter and including a control store responsive to said character signals indicative of said starting and said ending characters for generating a first and a second plurality of control signals, said adapter being responsive to said first plurality of control signals for generating said plurality of product signals,

said controller including an arithmetic logic unit responsive to said second plurality of control signals and said plurality of product signals for generating signals indicative of said calculated check digit characters, and being further responsive to said character signals indicative of said check digit character for comparison with said calculated check digit characters.

4,325,118

INSTRUCTION FETCH CIRCUITRY FOR COMPUTERS

Joseph DeVita, Laguna Hills, and Brian Pirzadeh, Costa Mesa, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Mar. 3, 1980, Ser. No. 126,313

Int. Cl.³ G06F *7/00, 9/00*

U.S. Cl. 364—200 **14 Claims**

6. In a computer system which includes bus means for parallel transfer of data words of two bytes between modules coupled to it, memory means coupled to the bus means for retrieval of a program word specified by an address, and instruc-

tion processing logic means for generating a fetch request signal requesting a program byte for execution, an instruction fetch logic comprising:

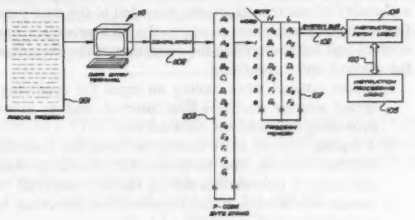
an instruction register coupled to the bus means for holding a program word retrieved from the memory means;

an address register coupled to the bus means for storing the address of the program word being retrieved from the memory means for the instruction register;

a multiplexer coupled to the instruction register and responsive to a selection signal for providing the contents of a selected byte of the instruction register to the instruction processing logic means, in accordance with the selection signal;

a translation state register for storing information specifying which program byte being held in the instruction register should be transferred to the instruction processing logic means upon its next fetch request;

control logic including (1) means for inspecting the information in the translation state register upon receiving the fetch signal from the instruction processing logic means to determine the next program byte to be transferred to the



instruction processing logic means, (2) means for altering the contents of the address register to correspond to the address in the memory means of the program word containing the byte to be next transferred to the instruction processing logic means, and supplying via the bus means the address register contents to the memory means to cause retrieval of the addressed program word, and transferring the retrieved program word to the instruction register, (3) means responsive to the translation state register for generating the selection signal to the multiplexer to select for transfer to the instruction processing logic means the program byte in the instruction register specified by the translation state register, and (4) means responsive to the instruction processing logic means and the previous information stored in the translation state register for setting the contents of the translation state register to specify the next program byte to be transferred to the instruction processing logic means, thereby providing a sequence of successively different bytes of the program to the instruction processing logic means upon successive fetch signals from the instruction processing logic means.

4,325,119

PROCESS AND APPARATUS EMPLOYING MICROPROGRAMMED CONTROL COMMANDS FOR TRANSFERRING INFORMATION BETWEEN A CONTROL PROCESSOR AND COMMUNICATIONS CHANNELS

John P. Grandmaison, Hampton, N.H.; Robert E. Huettner, Acton, Mass.; John H. Vernon, Milford, Mass., and Kin C. Yu, Burlington, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 19, 1977, Ser. No. 760,783

Int. Cl.[3] G06F *9/46, 9/22*

U.S. Cl. 364—200 **14 Claims**

1. In a data processing system including a main memory and a plurality of communication channels, said system having a central processing unit and a microprogrammed communication processor including a control element having a program memory storing microprogram instructions to enable said processor to control the transfer of data between said main memory and the other elements of said system, including said central processing unit and said communication channels, a machine implemented process in which said processor is controlled by said stored microprogram instructions to perform the method steps of:

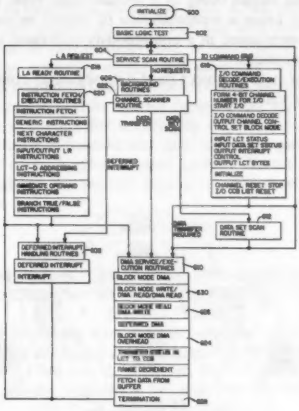
A. determining whether said central processing unit has issued a control instruction to said processor;

B. executing said control instruction if said step of determining indicates that said control instruction has been issued;

C. repeating said steps of determining and executing until said step of determining indicates that said control instruction is not presently issued;

D. determining, if no control instruction is detected during step A, whether one of said channels requires servicing;

E. servicing a said channel requiring servicing if said last-



mentioned step of determining indicates such service requirement;

F. repeating said steps of determining, executing, repeating, determining, and servicing until a determination is made that a said channel does not require servicing;

G. accessing control commands associated with a first said communication channel if there is no indication that a channel requires servicing;

H. servicing said first channel if its said control commands indicate that the execution of said control commands is required;

I. repeating said first step of determining and the further steps following said first step of determining until said step of accessing is entered again;

J. repeating said step of accessing for a second said channel;

K. repeating said second mentioned step of servicing for said second said channel; and

L. reentering said first step of determining.

4,325,120

DATA PROCESSING SYSTEM

Stephen R. Colley, Aloha; George W. Cox, Portland; Justin R. Rattner, Aloha, and Roger C. Swanson, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 21, 1978, Ser. No. 971,661

Int. Cl.[3] G06F *13/00*

U.S. Cl. 364—200 **56 Claims**

1. For use in a data processing system including at least one processor capable of executing an operation by means of an operator specified in an instruction, said operator including a class field specifying the operator class to which said operator belongs, said system having instruction objects defining an

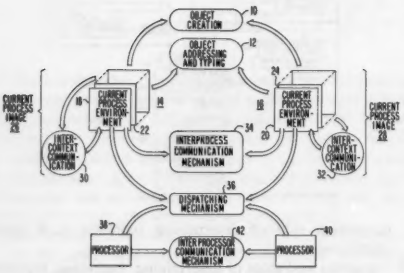
operation, and data objects, said objects stored in a memory which can be shared by a number of processors, an object-based access mechanism comprising:

means for decoding said instruction, said decoding means including means for decoding said class field specifying the operator class to which said operator belongs;

first means for registering first access information, said first access information providing information for locating a description (a first segment descriptor) of a first object (a data segment) stored in said memory, said first object being of a first basic type, said first object being a representation of related first information maintained in a contiguously-addressed set of memory locations;

second means for registering second access information, said second access information providing information for locating a description (a second segment descriptor) of a second object (an access list) stored in said memory, said second object being of a second basic type, said second object being a representation of related second information maintained in a contiguously-addressed set of memory locations;

said first type of object (said data segment) containing data scalar values;



said second type of object (said access list) containing access descriptors, at least one of said access descriptors providing information for locating said description of an object (said segment descriptor) and information for defining the extent of access to an object accessible through the use of said access descriptor and said segment descriptor;

each of said segment descriptors including a type field for indicating that the segment of said first or second type of object from which operands are obtainable for execution by said operator correspond to a particular one of said first or second types;

means for registering said segment decriptor type fields; and

third means connected to said instruction decoding means, to said first and said second means and to said segment descriptor type field registering means, responsive to said operator specified in said instruction, for accessing said memory, said third means including means for invoking said first means or said second means, to access said memory, upon the condition that said class field in said operator for specifying the operator class to which said operator belongs and said segment descriptor type field each indicate that the content of the segment accessible by said first or second means corresponds to said first type of object or said second type of object, respectively.

4,325,121

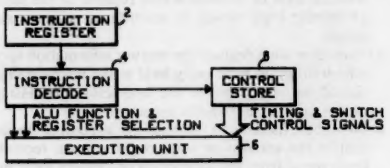
TWO-LEVEL CONTROL STORE FOR MICROPROGRAMMED DATA PROCESSOR

Thomas G. Gunter, and Harry L. Tredennick, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 961,796, Nov. 17, 1978. This application May 21, 1979, Ser. No. 41,135

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 **5 Claims**



1. A data processor adapted for microprogrammed operation and including an execution unit for executing sequentially a plurality of macroinstructions provided to the data processor from a macroinstruction memory, the data processor having a control unit for controlling the operation of the execution unit, the control unit comprising:

a. a first control store having an input for receiving a selected address during a first interval, and an output for providing first address information;

b. a second control store having an input for receiving the selected address, and an output for providing execution unit control information during the first interval;

c. means for storing a macroinstruction provided by the macroinstruction memory,

d. decoding means coupled to the means for storing a macroinstruction and responsive to a field of the macroinstruction for providing as an output a plurality of addresses,

e. address selection means coupled to the decoding means for receiving the plurality of addresses, and responsive to the address information from the output of the first control store for providing the selected address from one of said plurality of addresses for presentation to the first and second control stores during a subsequent interval

f. whereby the execution unit control information is sequenced by the first control store and provided to the execution unit by the second control store.

4,325,122

METHOD AND APPARATUS FOR EVENT RATE PROSPECTING AND APPLICATION TO WIND PROSPECTING

Bennett A. Parks, 3230 St. Matthews Dr., Sacramento, Calif. 95821, and Stephen I. Parks, 19616 Meredith Dr., Derwood, Md. 20855

Filed Jan. 10, 1980, Ser. No. 110,951

Int. Cl.³ G06F *15/54*

U.S. Cl. 364—420 **12 Claims**

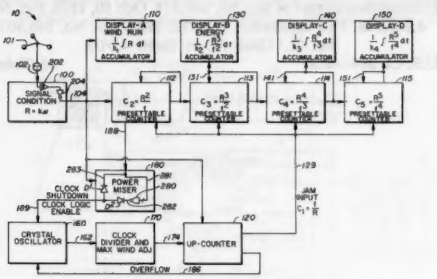
1. A method for assaying behavior of interrelated variables for a predetermined period as a plurality of numerical values at remote locations in response to the output of an event counting sensor having an output signal as a digital pulse stream whose rate is proportional to an increment of events per unit time to be measured per unit time said method comprising the steps of:

accumulating a value representative of accumulating events for said predetermined period by applying said pulse stream signal to a first counter for said predetermined period;

digitally integrating the square of said pulse stream signal by a first constant signal for said predetermined period;

accumulating a value representative of real energy for said predetermined period by digitally integrating the cube of said pulse stream signal divided by the square of said first constant signal only as said constant signal is applied;

accumulating a value representative of a first energy density function for said predetermined period by integrating the fourth power of said pulse stream signal divided by the cube of said first constant signal simultaneously with the



integrating of said cube of said pulse stream signal only as said constant signal is applied; and

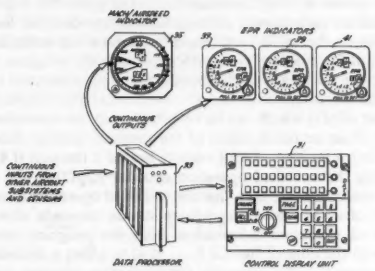
registering said accumulating events value, said real energy value and said first energy density function value.

4,325,123

ECONOMY PERFORMANCE DATA AVIONIC SYSTEM

Donald A. Graham, Redmond; Delwin R. Hoffman, Kirkland, and Peter M. Morton, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 28, 1978, Ser. No. 929,011
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—431.07 **64 Claims**



1. An economy performance data avionic system for a jet aircraft for producing the most economical engine thrust and speed information for the various phases of a flight, said jet aircraft including at least one jet engine and sensors and subsystems for producing an actual thurst signal for each jet engine, an actual speed signal representing the speed of said aircraft, and an altitude signal representing the altitude of said aircraft, said economy performance data avionic system comprising:

speed indicator means including a first display means connected to the appropriate one of said sensors and subsystems of said aircraft for receiving said actual speed signal and producing a display of said actual speed of said aircraft, said speed indicator means including a second display means for displaying the most economical speed of said aircraft;

thrust indicator means including thrust indicators equal in number to the number of jet engines of said jet aircraft, each of said thrust indicators including a first display means connected to the appropriate one of said sensors and subsystems of said aircraft for receiving said actual thrust signal related to one of said jet engines and producing a first display displaying the actual thrust of said one of said jet engines, each of said thrust indicators including a second display means for displaying the most economical thrust for the related one of said jet engines;

a control display unit for receiving manually inserted mode of operation and parameter information and producing, in accordance therewith, mode of operation and parameter data signals, said parameter information including a dimensionless INDEX number that represents a chosen relationship between fuel costs and trip time costs; and,

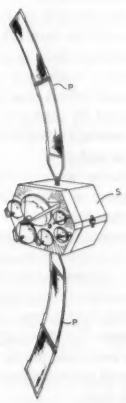
a data processor connected to said control display unit for receiving said mode of operation and said parameter data signals and connected to said sensors and subsystems of said aircraft for receiving said actual thrust signals, said actual speed signal and said altitude signal, said data processor including a memory having stored therein, in tabular form, data related to said aircraft, said data processor determining the most economical thrust and speed of said aircraft for the various phases of a flight based on said mode of operation, parameter data, actual thrust, actual speed and altitude signals and on said data stored in tabular form in said memory and, in accordance therewith, produce economy thrust and economy speed control signals related to said most economical thrust and speed, said economy thrust control signals being applied to said thrust indicators for controlling the second displays of said thrust indicators and said economy speed control signal being applied to said speed indicator means for controlling the second display of said speed indicator means.

4,325,124

SYSTEM FOR CONTROLLING THE DIRECTION OF THE MOMENTUM VECTOR OF A GEOSYNCHRONOUS SATELLITE

Udo Renner, Leiden, Netherlands, assignor to Organisation Europeenne de Recherches Spatiales, Noordwijk, Netherlands

Filed Feb. 5, 1980, Ser. No. 118,847
Claims priority, application Belgium, Feb. 28, 1979, 193756
Int. Cl.³ G06F *15/50*; B64G *1/44*
U.S. Cl. 364—459 **4 Claims**



1. Method for controlling the direction of the momentum vector of a satellite in a geosynchronous orbit, the satellite having at least a pair of solar panel arrays driven to track the sun when deployed in orbital configuration, the method comprising the steps of:

reading the value of the roll angle of the satellite and comparing it to a predetermined threshold value; generating a deviation signal when the roll angle value exceeds the threshold value at predetermined times;

inhibiting one solar panel array drive in response to the deviation signal, and re-enabling said solar panel array drive after a predetermined time interval has elapsed.

4,325,125

APPARATUS FOR ORIENTING OUT-OF-ROUND WORKPIECES

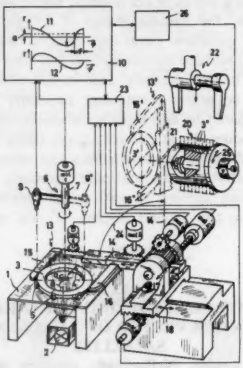
Jürgen Buchfeld, North Muskegon, Mich., assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 1,911, Jan. 8, 1979, abandoned. This application Sep. 30, 1980, Ser. No. 192,255

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951605

Int. Cl.³ G06F *15/46*; G05B *15/02*

U.S. Cl. 364—474 **7 Claims**



1. An apparatus for orienting an out-of-round workpiece into desired angular and lateral positions for a machining operation, comprising in combination:

(a) a scanning device including a scanner supported for orbital travel about an axis;

(b) a planar support situated in the vicinity of said scanner and being traversed by said axis; said planar support receiving the workpiece thereon in an at least approximately coaxial relationship with said axis for determining the actual angular and lateral positions of the workpiece on said planar support by scanning the workpiece with said scanner during orbital travel of said scanner relative to the workpiece about said axis;

(c) transporting means for conveying the workpiece from said planar support to a location spaced therefrom; said transporting means including

(1) a gripper means for grasping the workpiece at said planar support and for releasing the workpiece at said location; said gripper means having a gripper axis; and

(2) moving means for displacing said gripper means parallel to and about said gripper axis;

(d) correcting means for reorienting the workpiece, at a location remote from said planar support, from said actual angular and lateral positions into said desired angular and lateral positions; and

(e) computer means for storing data on the desired angular and lateral positions of the workpiece; said scanning means being connected to said computer means for applying thereto data on the actual angular and lateral positions of the workpiece; said computer means being connected to said correcting means for applying lateral and angular correcting signals to said correcting means; said lateral and angular correcting signals being derived by said computer means from a comparison between data on said actual and said desired lateral and angular positions.

4,325,126

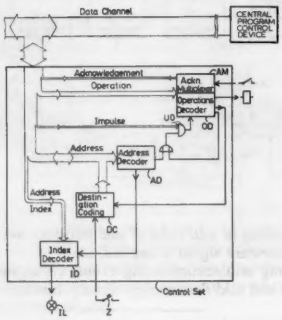
CENTRALLY CONTROLLED CONVEYOR SYSTEM

Ferdinand Thoma, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 949,874, Oct. 10, 1978, Pat. No. 4,240,148. This application May 12, 1980, Ser. No. 148,807

Int. Cl.³ G06F *15/46*; B65G *43/00*

U.S. Cl. 364—478 **10 Claims**



1. A conveyor system with dispatching and receiver stations having station-individual control sets, which are coupled to control and signal devices for the station, said control sets being connected in parallel to a multiconductor address line for coupling to a central program control device, the dispatching stations each having a destination selection device, and dispatching stations ready for dispatching being activated by applying station-individual address information to the address line by means of the program control device, and the dispatching stations each having an assigned address decoder for responding to the applied address information when coincidence is present for enabling communication with the program control device via an acknowledgement line jointly assigned to all stations, characterized in that all control sets have an operation decoder (OpD) which can be switched ready for operation by means of an actuation signal of the assigned address decoder (Dh, Dz), a multiconductor control line (sl **1** through sl **4**) for coupling the switched operation decoder (OpD) to the program control device such that the switched operation decoder (OpD) of an activated dispatching station responds after the output of operation information from the program control device to the control line (sl **1** . . . sl **4**) to effect a destination information transfer operation, the destination selection device (**Z0** through **Z9**) of each dispatching station being connected to the address line (al **1** . . . al **12**) in parallel with the assigned address decoder (Dh, Dz) for the transmission of destination information identifying a desired receiver station to the central program control device via the address line, and each receiver station being responsive to address information produced by the program control device in accordance with such transmitted destination information, and said operation decoders of the dispatching and receiver stations being responsive to operation information for introducing and concluding the conveyor process.

4,325,127

FLOW METER SYSTEM

Emery Major, 17 Skylark Dr. #1, Larkspur, Calif. 94939

Filed Nov. 30, 1979, Ser. No. 98,739

Int. Cl.³ F01L *25/08*

U.S. Cl. 364—510 **20 Claims**

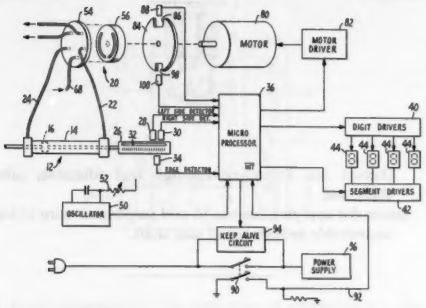
1. A selectively energizable flowmeter system comprising, in combination:

valve means defining at least one fluid inlet port for receiving fluid under pressure and a plurality of fluid distribu-

tion ports, said valve means including a valve element selectively movable to direct said liquid to predetermined fluid distribution ports;

metering means; and

valve element positioning means connected to said valve element operable upon energization of said system to

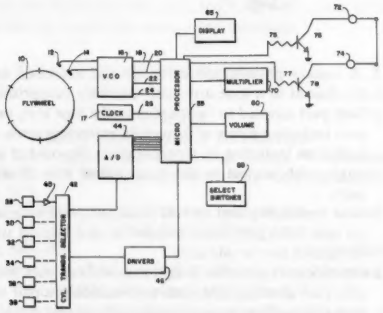


establish fluid flow communication between said metering means and at least one valve means fluid distribution port and responsive to de-energization of said system to direct pressurized fluid entering said valve means fluid inlet port to a valve means fluid distribution port bypassing said metering means.

4,325,128
CIRCUIT FOR MEASURING THE HORSEPOWER PER CYLINDER FOR AN ENGINE

Albert C. Abnett, 104 Kimothy Dr., Westerville, Ohio 43081, and Mark E. Towns, 1420 Inglis Ave., Columbus, Ohio 43212

Filed Apr. 27, 1979, Ser. No. 33,881
Int. Cl.[3] G06F *15/20*; G01M *15/00*
U.S. Cl. 364—511 **8 Claims**



1. A circuit for measuring the horsepower per cylinder of a reciprocating engine comprising:

a pair of sensors positioned adjacent the flywheel of said engine, the first of said sensors responding once per revolution of said cylinder, and said second of said sensors responding once for each cylinder in one revolution;

a pulse forming generator having the outputs of said sensors connected thereto and operative to provide 360 pulses for each degree per revolution, six pulses each representing one revolution per cylinder, one pulse per revolution representing dead center, and 60 pulses per revolution,

a clock operative to provide time period pulses, and means for utilizing said time period with said 60 pulses per revolution for deriving a signal representative of the r.p.m. of said engine;

a pressure transducer mechanically connected to each of said cylinders of said engine;

a selector switch for selecting the cylinder pressure transducer to be measured,

said transducers together with said six pulses operative to provide a voltage signal representing that particular cylinder;

a volume signal and means for multiplying said pressure measurement against said volume signal for each degree of rotation of said cylinder and for summing the resultants thereof, and

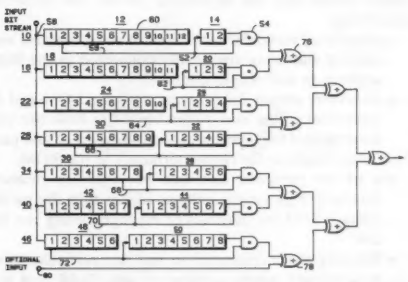
means for multiplying said summed resultants with said r.p.m. signal;

display means for displaying the horse power for each cylinder.

4,325,129
NON-LINEAR LOGIC MODULE FOR INCREASING COMPLEXITY OF BIT SEQUENCES

Edward J. Groth, Jr., Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 1, 1980, Ser. No. 145,418
Int. Cl.[3] H03K *3/84*
U.S. Cl. 364—717 **2 Claims**



1. A non-linear digital generator circuit for producing controllably complex bit sequences comprising in combination:

a plurality of shift registers each being of predetermined bit length, each of said plurality of shift registers comprising:

a first segmented portion being controllable as to a bit delay length between an input thereto and an output thereof; and

a second segmented portion having a fixed bit length for implementing a predetermined span between an input thereto and an output thereof, said input being derived from said output of said first segmented portion;

means for controlling said bit length of each of said plurality of first segmented portions of said plurality of shift registers;

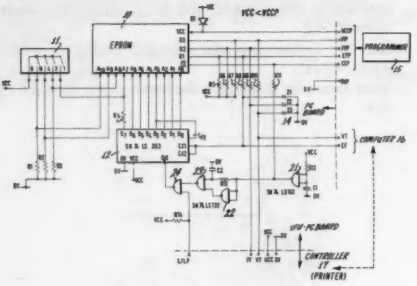
a plurality of means for combining said inputs and outputs of each of said second segmented portions, each of said combining means having an output thereof; and

means for modulo-two adding said outputs of said plurality of said combining means.

4,325,130
REPROGRAMMABLE CONTROL APPARATUS

Gerald Tiltscher, Burlafingen, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,482
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910891
Int. Cl.[3] G06F *9/00*
U.S. Cl. 364—900 4 Claims



1. In a control apparatus which includes an electrically programmable ROM, addressing means connected to addressing inputs of the ROM, and an output circuitry connected to output terminals of the ROM, the output circuitry, the addressing means, and the ROM operating at a particular voltage level for addressing and ROM content readout operation, there being a voltage supply bus for connection to a source of regular voltage supply and connected for feeding power to the output circuit and the addressing means, the combination comprising:

a plurality of particular terminals not being used for regular readout and being electrically connected to the ROM in addition to said output circuitry;

a protective circuit for protection of the ROM and being connected to the said output circuit to limit the voltage level thereof for voltages applied via some of said particular terminals to the output terminals of the ROM;

one of the particular terminals provided for receiving a relatively high supply voltage, higher than the particular voltage level for purposes of reprogramming the ROM; and

a Schottky diode connected to said one particular terminal to a voltage supply terminal of said ROM, and to said voltage supply bus for feeding the regular supply voltage as applied to the ROM via the diode and, thereby, to bias the diode in forward direction, the high supply voltage, upon being applied being appied to said one particular terminal, biasing the diode in the reverse.

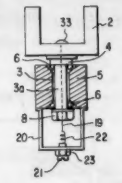
4,325,131
TONE ARM BEARING SYSTEM

Tamio Takeda, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1979, Ser. No. 61,914
Claims priority, application Japan, Aug. 15, 1978, 53-111883[U]; Aug. 15, 1978, 53-111884[U]
Int. Cl.[3] G11B *3/18*
U.S. Cl. 369—255 19 Claims

1. In a bearing system for a tone arm for use with a phonograph record player or the like where the bearing system includes a bracket for supporting said tone arm, a rotatable, tubular shaft connected to said bracket for permitting horizontal rotation of said tone arm, and support means for bearing said shaft including ball bearings or the like, the improvement comprising

a suspension wire attached to said bracket at the upper end



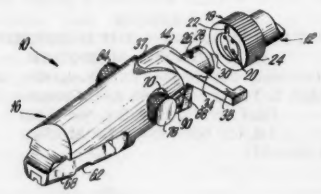
thereof and extending through said rotatable, tubular shaft; and

means for applying tension to said suspension wire to lessen undesirable movement of said shaft.

4,325,132
UNITARY PHONOGRAPH CARTRIDGE AND HEAD ASSEMBLY

John P. Kuehn, Danbury, Conn., assignor to Audio Dynamics Corporation, New Milford, Conn.

Filed Mar. 5, 1980, Ser. No. 127,524
Int. Cl.[3] G11B *21/24*
U.S. Cl. 369—256 4 Claims



1. A unitary phonograph cartridge and headshell assembly for attachment to a tone arm, said assembly comprising:

a fixed part adapted to be coupled to the tone arm, said fixed part including a pair of forwardly extending arms, each of said arms including an elongated slot disposed at an acute angle with respect to the longitudinal axis of said fixed part;

indicia means disposed on said fixed part, said indicia means on said fixed part being parallel to and aligned with said elongated slot in said arm;

a movable part movably joined to said fixed part, said movable part abutting said arms and including a pair of openings disposed proximate to said slots in said arms;

stylus/transducer means fixedly joined to said movable part;

indicia means disposed on said movable part, said indicia means on said movable part being aligned with said indicia means on said fixed part when said stylus/transducer means is parallel to the record to be played;

locking means extending through said openings in said movable part and said elongated slot means in said arms, said locking means defining a pivotal axis for said movable part and permitting said movable part to slide along said elongated slot to thereby permit said movable part to be displaced both along said elongated slot and pivoted with respect to said fixed part and to facilitate the user in maintaining parallelism between said stylus/transducer means and the record to be played.

4,325,133
DISC PLAYER APPARATUS

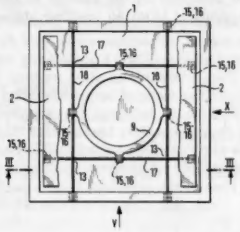
Gustav Reitmayer, Turmstrasse 27, 7630 Lahr 1, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,227

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909564

Int. Cl.³ G11B *3/60*

U.S. Cl. 369—263 **15 Claims**



1. In an apparatus for the reduction of vibrations in a disc player comprising means for forming a base (1), an oscillating chassis (2) carrying a sound pick-up system, a turn-table, and a motor driving the turn-table; and means for resiliently supporting the oscillating chassis on the base, the improvement wherein:

first and second mutually normal pairs of spring bars (10, 11 and 17, 18, respectively), each with two parallel spring bars (10 and 11, and 17 and 18, respectively), that cooperate to resiliently support the oscillating chassis (2);

means for mounting first ends of the first pair of spring bars (10 and 18, respectively) on the base (1);

means for mounting first ends of the second pair of spring bars (11 and 17, respectively) on the oscillating chassis (2);

frame means for interconnecting portions of the two pairs of spring bars disposed between the base and chassis; and

the spring bars (10, 11 and 17, 18, respectively,) and the frame means (9) form an oscillating system having a center of inertia that coincides with the center of inertia of the oscillating chassis (2), motor, and turntable.

4,325,134
VIDEO DISC DEFECT DETECTOR

Howard M. Langley, Mooresville, and Joseph W. Stephens, Plainfield, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,287

Int. Cl.³ G11B *27/36*; H04N *5/80*

U.S. Cl. 369—58 **10 Claims**

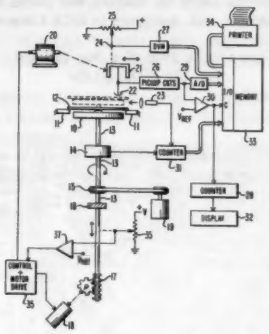
1. A capacitive video disc defect test apparatus comprising:

a base for rotatably supporting a disc record;

a dielectric stylus having a face generally normal to the plane of the disc record and normal to information tracks on the surface of the disc record when in its operable position; said face having a thin electrically conductive electrode thereon, an edge of said electrode extending over a plurality of said information tracks, and the electrode and the disc forming a substantially constant capacitance therebetween substantially unaffected by record information;

a carriage for translating said stylus radially across the disc record in coordination with the disc rotation so that the entirety of the recorded disc area is swept by the stylus electrode;

means for compliantly mounting said stylus in the carriage so that the stylus engages the disc and is free to disengage the disc upon striking a convex disc defect;



means coupling with said electrode for measuring a decrease in the value of the electrode-disc capacitance indicative of the stylus electrode disengaging the disc record.

4,325,135
OPTICAL RECORD CARRIER AND APPARATUS FOR READING IT

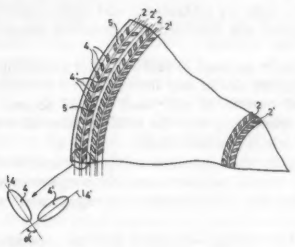
Jan G. Dil, and Jacobus P. J. Heemskerk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,276

Claims priority, application Netherlands, Sep. 3, 1979, 7906576

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—110 **41 Claims**

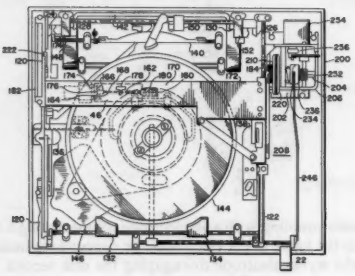


1. A record carrier containing information in a form readable by a read beam of polarized radiation, said carrier comprising an information structure having a first plurality of spaced apart, elongated information areas which define a first track portion and wich have a width at most of the order of magnitude of the effective wavelength of the radiation and a geometry such that said information areas of said first plurality produce maximum modulation of the read beam when the radiation is polarized in a first direction parallel to the longitudinal direction of said information areas of said first plurality and produce minimum modulation of the read beam when the radiation is polarized in a second direction transverse to said longitudinal direction thereof, and a second plurality of spaced apart, elongated information areas which define a second track portion adjacent said first track portion and which have a geometry such that said information areas of said second plurality produce maximum modulation of the read beam when the radiation is polarized in a direction perpendicular to said first direction and produce minimum modulation of the read beam when the direction of polarization of the radiation is parallel to said first direction.

4,325,136
VIDEO DISC PLAYER HAVING CARRIAGE DRIVE APPARATUS

Philip E. O'Connell; Larry M. Hughes, and James D. Fletcher, all of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,060
Int. Cl.³ G11B *25/04*
U.S. Cl. 369—219 **4 Claims**



1. In a player for recovering prerecorded signals from a turntable-supported disc record by means of a signal pickup when pickup/record relative motion is established during playback; said signal pickup being disposed in a translatable carriage; a carriage drive apparatus comprising:

(a) an input shaft rotatably mounted in said player;

(b) a first member loosely mounted on sand having a first clutch portion; said first member being coupled to said carriage;

(c) a second member consisting of a second clutch portion disposed at one end of a sleeve portion; said second member being loosely mounted on said shaft such that said clutch portions are juxtaposed; said sleeve portion having an elongated slot disposed in a direction parallel to said shaft;

(d) a pin fixedly secured to said shaft and extending through said elongated slot in said sleeve portion for coupling the rotational motion of said shaft to said second member without interfering with the axial location of said second member relative to said shaft;

(e) a spring disposed between said pin secured to said shaft and said second member rotatably coupled to said shaft for biasing said clutch portions in engagement with each other;

(f) means for rotating said input shaft at a speed such that said carriage, coupled to said first member, follows the motion of said signal pickup across said record; and

(g) means for selectively displacing said second member in a direction causing said clutch portions to disengage to permit motion of said carriage with freedom from hindrance by said carriage drive apparatus.

4,325,137
POWER SUPPLY SYSTEM TO TERMINAL EQUIPMENT THROUGH AN OPTICAL FIBER CABLE

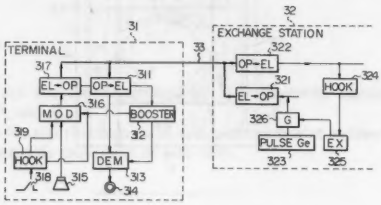
Ikeda Yoshikazu, Tama, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1980, Ser. No. 160,943
Claims priority, application Japan, Jun. 26, 1979, 54-79713
Int. Cl.³ H04J *3/02*; H04B *9/00*
U.S. Cl. 370—4 **6 Claims**

3. A power supply system from an exchange station to terminal equipment through an optical fiber cable for operating said terminal equipment comprising;

(a) a single optical fiber cable connecting the exchange station to terminal equipment for transmitting signals in both directions from the exchange station to terminal equipment and from the terminal equipment to the exchange station, and for transmitting an optical energy in the form of an optical pulse from the exchange station to the terminal equipment, all of said transmissions being on time divisional basis,

(b) terminal equipment having at least a microphone and a receiver connected to said optical fiber cable through conversion means between an electrical form and an optical form, a generator means for generating an electrical signal upon detection of the change of the status of the terminal equipment from an inactive status to an active



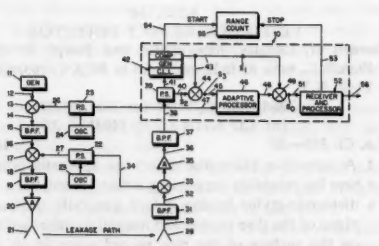
status, and the output of said generator means being forwarded to said exchange station through said optical fiber cable, and

(c) said exchange station having at least an exchange control system connected to the optical fiber cable through conversion means between an optical form and an electrical form, a power pulse generator, a gate circuit for passing the power pulse of the power pulse generator to the optical fiber cable, said control system controlling said gate circuit so that when the terminal equipment is inactive the gate circuit is closed and when the terminal equipment is active the gate circuit is almost always opened.

4,325,138
CONTINUOUS WAVE ADAPTIVE SIGNAL PROCESSOR SYSTEM

John W. Zscheile, Jr., Murray, Utah, assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,871
Int. Cl.³ H04K *1/04*
U.S. Cl. 375—1 **8 Claims**



1. A spread spectrum carrier wave apparatus of the type having a transmitter in close proximity to its receiver, which couples undesirable leakage signals from the transmitter into the receiver path with the desired received signals, the combination comprising:

a random code generator for generating a plurality of carrier frequency random code modulated signals,

a first processing path for processing said signals from said generator to provide random code generated modulated signals,

a transmitting antenna for transmitting the processed random code generated modulated signals,

a receiving antenna for receiving desired delayed and attenuated replicas of said transmitted processed random code generated modulated signals,

a second processing path for processing said desired delayed and attenuated replicas of said random code generated modulated signals,

said second processing path being electromagnetically coupled to said first processing path and containing an undesired leakage signal which is a weakened version of said processed random code modulated signals,

first code lock loop means connected to said second processing path for generating a tracking signal locked on to said undesired random code modulated signals for generating an output reference signal in phase with said random code,

a first multiplier-mixer coupled to said output reference signal and to said second processing path containing said desired and said undesired random code signals,

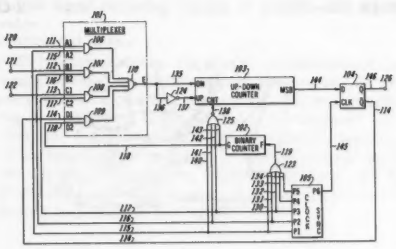
an adaptive processor coupled to the output of said first multiplier-mixer and said first signal path for eliminating said undesired random code signal, and

a second multiplier-mixer coupled to the output of said adaptive processor for eliminating said output reference signal, thereby leaving said desired delayed and attenuated carrier frequency random code modulated signals.

4,325,139
CIRCUIT FOR COMBINING DELTA MODULATED SIGNALS

Gilbert A. Van Dine, Winfield Township, DuPage County, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 28, 1980, Ser. No. 181,983
Int. Cl.³ H04M *3/56*
U.S. Cl. 375—28 **8 Claims**



1. An electrical circuit for combining a plurality of streams of input bits representing delta modulated analog signals in digital form, each input bit having a first and a second state, characterized in that said circuit comprises:

counter means **(103)** responsive to increment and decrement signals to increment or decrement, respectively, a count contained therein and having a most significant bit position;

clock means **(105)** for generating signals defining clock cycles;

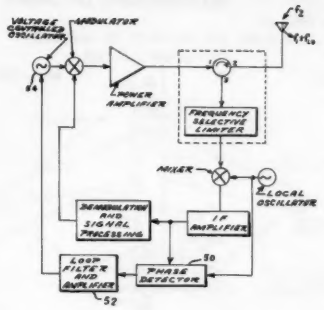
circuit means **(104)** connected to said counter means and said clock means for generating an output signal representative of the state of said most significant bit position in each clock cycle and a feedback bit, having said first and said second state, representative of the state of said most significant bit position in a first clock cycle; and

multiplexer means **(101, 124)** for sampling an input bit from each of said streams and said feedback bit and applying to said counter means an increment signal for each sampled bit in said first state and a decrement signal for each sampled bit in said second state, in a second subsequent clock cycle, whereby a plurality of said output signals generated in a plurality of successive clock cycles represents the approximate linear sum of said delta modulated analog signals in digital form.

4,325,140
FULL DUPLEX COMMUNICATION SYSTEM APPARATUS USING FREQUENCY SELECTIVE LIMITERS

Steven N. Stitzer, Ellicott City, Md., assignor to The United States of America as represented by the Scretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 949,367, Oct. 6, 1978, abandoned. This application Mar. 13, 1980, Ser. No. 129,860
Int. Cl.³ H04B *1/50*
U.S. Cl. 455—19 **6 Claims**



1. In a microwave duplexer communications system, a frequency tracking repeater apparatus comprising in combination:

a transmit/receive antenna, said transmit/receive antenna receiving a carrier frequency f_2,

a carrier frequency signal generator to provide a carrier frequency signal, said carrier frequency signal generator generating a carrier frequency f_1,

a first mixer connected to said carrier frequency signal generator to receive said carrier frequency signal f_1 and a modulation signal, said first mixer mixing said carrier frequency signal and said modulation signal to provide a modulated carrier frequency signal for transmission by said transmit/receiver antenna,

a microwave circulator having first, second and third ports, said first port receiving said modulated carrier frequency signal from said first mixer, and said second port being connected to said transmit/receive antenna and passing transmitted and received signals therethrough,

a frequency selective limiter unit connected to said third port of said microwave circulator, said frequency selective limiter unit attenuating signals that exceed a predetermined threshold level and providing low loss transmission of signals below said predetermined threshold, said frequency selective limiter unit operating over a predetermined band of frequencies and allowing transmission of output signals therethrough that comprise a plurality of frequencies having a level lower than said predetermined threshold level,

a local oscillator generating a local oscillator signal,

a second mixer connected to said frequency selective limiter unit to receive the output signals therefrom, said second mixer mixing said output signals from said frequency selective limiter unit with said local oscillator signal to provide an IF signal, and

an IF amplifier/demodulator unit connected to said second mixer unit to receive said IF signal, said IF amplifier/demodulator unit amplifying and demodulating said IF signal to extract the intelligence thereon, and

a phase lock circuit for locking said carrier frequency signal generator frequency f_1 to said received carrier signal frequency f_2, said phase lock circuit comprising,

a phase detector receiving the outputs of said local oscillator and said second mixer and controlling said carrier frequency signal generator in response thereto, and

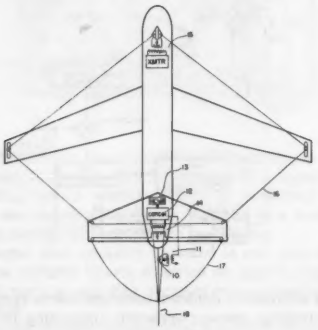
a feedback circuit from said IF amplifier/demodulator unit to said first mixer to provide a modulation signal.

4,325,141

INTERCONTINENTAL AIR TO AIR COMMUNICATIONS BY AN OPTIMUM MODE

Rabindra N. Ghose, 8167 Mulholland Ter., Los Angeles, Calif. 90046

Filed Sep. 22, 1977, Ser. No. 835,513
Int. Cl.³ H04B *1/12*
U.S. Cl. 455—63 **7 Claims**



6. The method of communicating at low frequency and very low frequencies comprising;

the steps of positioning first and second aircraft at an altitude of at least one quarter of a wavelength of the desired low or very low frequency of operation above the earth's surface;

transmitting from said first aircraft a low frequency or very low frequency communication on a transmitter antenna adapted to transmit in the TE mode;

receiving this transmission at the second aircraft on a horizontal antenna adapted to receive TE mode transmissions;

receiving at said second aircraft ambient noise signals on a vertical antenna adapted to receive TE mode signals;

varying the amplitude and phase of said ambient noise signal to match the noise received at said horizontal antenna;

subtracting the varied noise signal from the received transmission; and

using said subtracted signal as the received signal at said second aircraft.

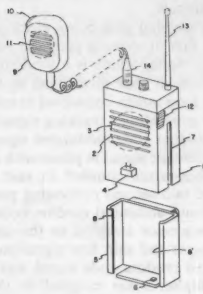
4,325,142

PORTABLE RADIO SET WITH A CARRYING HOLDER

Kunihiro Nakazawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1980, Ser. No. 172,377
Int. Cl.³ H04B *1/40, 1/20*
U.S. Cl. 455—89 **10 Claims**

1. A combination of a portable radio unit and a carrying holder for said portable radio unit, said portable radio unit having a grilled front face, first speaker means mounted so that audible sound from said first speaker means is radiated through said grilled front face, speaker circuit means for supplying said first speaker means with an audible sound signal, and first switch means for connecting and disconnecting said first speaker means to and from said speaker circuit means, said carrying holder having a switch member mounted thereon for activating said first switch means, wherein said first switch means and said switch member are respectively arranged, on said portable radio unit and said carrying holder in positions which are such that said first switch means is operated only when said portable radio unit is inserted into said carrying



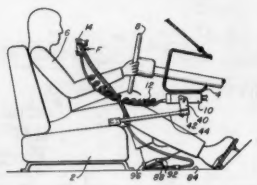
holder with said grilled front face oriented to be covered by said carrying holder, said first switch means being unoperated when said portable radio unit is inserted into said carrying holder with said grilled front face directed to be visible from outside.

4,325,143

MICROPHONE HOLDER ATTACHMENT AND SWITCH CONTROL THEREFOR

Leslie I. Kerr, 16 Polk Rd., Hingham, Mass. 02043

Filed Aug. 18, 1980, Ser. No. 178,695
Int. Cl.³ H04B *1/38*
U.S. Cl. 455—89 **2 Claims**



1. In a motor vehicle having a Citizens Band transceiver, a microphone connected to the transceiver and a control switch located externally of the microphone, a driver operated apparatus for actuating the said control switch, said apparatus characterized by a U-shaped bracket attachable to the transceiver member, said bracket being formed with a channelled portion and having a rearwardly extending arm secured in the channelled portion, an opposite end of the rearwardly extending arm being engageable with the seat of the said motor vehicle, a microphone holder frame for receiving the microphone therein, flexible tubular support means for the holder frame, said support means being located through the said arm and extending upwardly, an upper end of the support means secured in one side of the holder frame to position the holder frame and microphone in a speaking mode for a driver of the said motor vehicle, elongated switch actuating means slideably disposed through the flexible support means, said switch actuating means presenting at one extremity a switch button moveable into contact with the microphone control switch, a hinging foot pedal mechanism connected to the lower extremity of the switch acutating means and responsibe to foot pressure of a driver of the vehicle to advance and retract the actuator button, said hinging foot pedal mechanism including a base

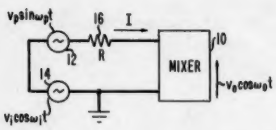
plate fastened to the floor of the vehicle, a foot pedal element pivotally attached to the base plate, a hinge part pivotally secured to an under side of the foot pedal and having a lower extremity of the switch actuating means fixed therein, a displaceable hinge part hinged to the said pivotally secured hinge part and slideable on the base plate, and spring means for resliently holding the said pivotally secured hinge part in a retracted position.

4,325,144

HYSTERETIC SIS JUNCTION MIXER

Susan E. G. Slusky, East Brunswick, and Ralph F. Trambarulo, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 22, 1980, Ser. No. 189,720
Int. Cl.³ H04B *1/26*; H03F *7/00*
U.S. Cl. 455—324 **5 Claims**



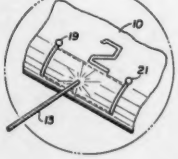
1. A mixer comprising:
a first source (**12**) producing a pump signal at a first frequency (ω_p);
a second source (**14**) producing an input signal at a second frequency (ω_i); and
a superconductor-insulator-superconductor (SIS) junction being responsive to said first and second sources and producing an output signal at a third frequency (ω_o), said output signal including regions of positive and negative value
characterized in that
the SIS junction possesses a hysteretic current-voltage chacteristic defined by predetermined positive and negative extreme critical current values ($\pm I_c$), said junction operating in a switching mode so that it is responsive to the pump and input signals such that the third frequency (ω_o) of the output signal produced by said junction is equal to the absolute value of the difference of twice the first frequency (ωp) of said pump signal and the second frequency (ω_i) of said input signal.

4,325,145

THERMAL DETECTION SYSTEM

Marshall J. Corbett, 15 Elberta Dr., Northport, N.Y. 11731, and Arnold London, 30 Julliard Dr., Plainview, N.Y. 11803

Filed Apr. 6, 1978, Ser. No. 894,178
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—600 **21 Claims**



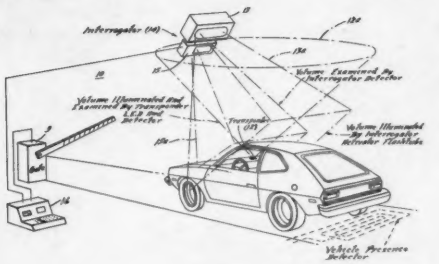
1. A thermal detection system for indicating the irradiation of a vehicle surface by means of a laser energy beam, the system comprising: a variable conductive heat detector including a plurality of Boron filaments encased in an insulating base forming an integral portion of the outer surface of the vehicle, a system power source electrically connected to said heat detector, temperature indication means connected to said heat detector to detect a change in resistance of said heat detector due to a variation in the temperature of the vehicle's outer surface, a signal generating means to produce an electrical signal responsive to said change in resistance, and, display means activated by said electrical signal to indicate an impingement of a beam of laser energy upon the outer surface of the vehicle.

4,325,146

NON-SYNCHRONOUS OBJECT IDENTIFICATION SYSTEM

John W. Lennington, 2491 Oakdale Dr., Ann Arbor, Mich. 48104

Filed Dec. 20, 1979, Ser. No. 105,651
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—604 **10 Claims**



1. An object indentification system comprising:
a transponder associated with the object to be identified including switching means responsive to a remote activation signal for producing a switching signal, memory means containing a coded data word identifying said object, and data transmission means responsive to said switching signal for optically transmitting a transponder signal representative of said coded data word at a frequency independent of the frequency of said switching signal, said data transmission means beginning transmission of said coded data word from a random point in said memory means; and
an interrogator for identifying said object including remote activation means for generating said remote activation signal, receiver means for receiving said transponder signal, and processing means for determining the identity of said object from said received transponder signal including decoding means for determining the start of said coded data word and decoding said word.

4,325,147

ASYNCHRONOUS MULTIPLEX SYSTEM

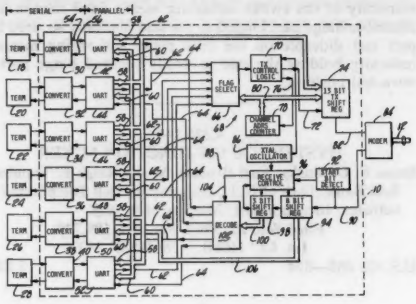
Alan P. Rothlauf, Ypsilanti, Mich., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Jun. 16, 1980, Ser. No. 159,571
Int. Cl.³ H04J *3/00, 4/00*
U.S. Cl. 370—91 **11 Claims**

1. An asynchronous multiplex system, comprising:
a plurality of first data storage means each adapted to receive a data word into storage therein from a corresponding data source;
means coupled with each of said plurality of data storage means for detecting the presence of a data word in any of said data storage means;
means for generating a multi-bit data code identifiable with that first data storage means in which the presence of a data word has been detected by said detecting means;

second data storage means connected with said generating means and with each of said first data storage means, and adapted to be coupled with a multichannel communication line for storing said data word and data code as single data message therein; and

control means coupled with said detecting means, each of said first data storage means, said generating means and said second data storage means, for causing said data word and said data code to be delivered into storage in said second data storage means, and for causing said data message to be delivered from said second data storage means to said communication line for transmission thereon.



DESIGN PATENTS

GRANTED APR. 13, 1982

ERRATA

For CLASS	See PATENT NO.
D32–066	263,781
D34–023	263,820
D32–023	263,842
D92–026	263,881

263,765

CUFF LINK WITH CENTERPIECE

Philip L. Engelhardt, New York, N.Y., assignor to S. Engelhardt & Co., New York, N.Y.

Filed May 21, 1979, Ser. No. 41,200

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D2—422

263,766

POCKET FOR JEANS OR THE LIKE

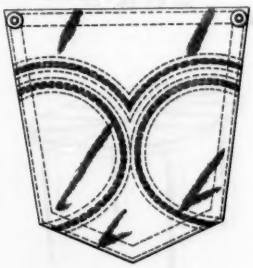
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear Ltd., New York, N.Y.

Filed Jul. 17, 1979, Ser. No. 58,997

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—28



263,767

HOLDER FOR A CHEWING TOBACCO POUCH OR THE LIKE

Tig Sogoian, 2521 K St., and Marc B. Blake, 2192 Yosemite Pkwy., both of Merced, Calif. 95340

Filed Nov. 26, 1979, Ser. No. 80,258

Term of patent 14 years

Int. Cl. D02—*99*

U.S. Cl. D2—400

263,768

HAIRBRUSH

Walter F. Birch, Bangor, Northern Ireland, assignor to Denroy Plastics Limited

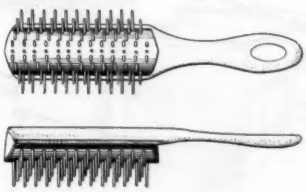
Filed Oct. 24, 1979, Ser. No. 87,806

Claims priority, application United Kingdom, Apr. 25, 1979, 989691/79

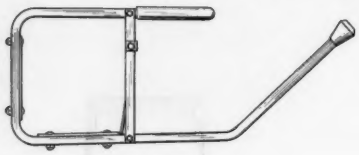
Term of patent 14 years

Int. Cl. D4—*02*

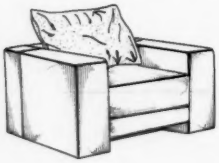
U.S. Cl. D4—35



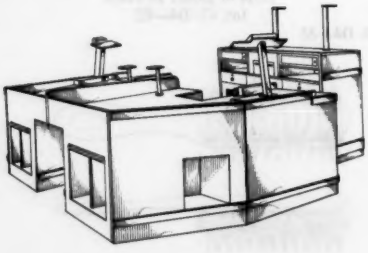
263,769
TABLE ATTACHABLE SEAT FOR A CHILD
George J. Euwema, 1880 NW. 40th Ct., and George W. Euwema, 1920 NW. 40th Ct., both of Fort Lauderdale, Fla. 33309
Filed Oct. 16, 1978, Ser. No. 951,473
The portion of the term of this patent subsequent to Jan. 29, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



263,770
SEAT
Merle C. Melchior, Venice, Calif., assignor to Pacific Furniture Manufacturing Co., Compton, Calif.
Filed Jan. 18, 1979, Ser. No. 4,502
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

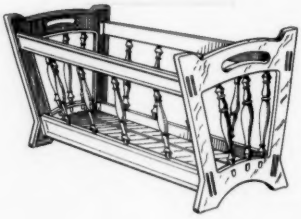


263,771
COMBINED MULTIPLE POSITION CHECKSTAND AND CONTROL CABINET ASSEMBLY
Robert T. Richins, Boise, Id., assignor to Waremart, Inc., Boise, Id.
Filed Apr. 9, 1979, Ser. No. 28,070
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—143



263,772
MIRROR
Alan Alpert, New York, N.Y., assignor to Tree Time, Inc., Newark, N.J.
Filed May 21, 1979, Ser. No. 40,744
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—244

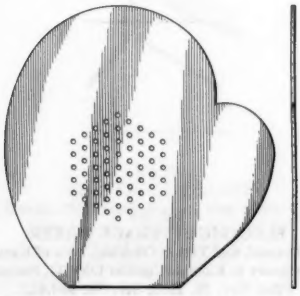
263,773
MAGAZINE RACK
Nicholas W. Keller, Lower Burrell, Pa., assignor to Action Industries, Inc., Cheswick, Pa.
Filed Aug. 2, 1979, Ser. No. 63,197
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153



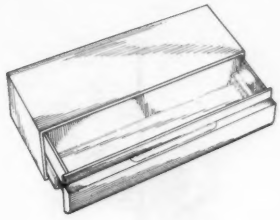
263,774
TABLE OR SIMILAR ARTICLE
Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation, Grenoble, France
Filed Aug. 13, 1979, Ser. No. 65,850
Claims priority, application France, Feb. 15, 1979, 2511
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

263,775
SHOWER STOOL
Glenn A. Hopper, 2188 Oakmont St., Sacramento, Calif. 95815
Filed Aug. 28, 1979, Ser. No. 70,449
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

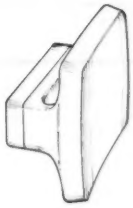
263,776
PERFORATED DRAIN COVER
Ward R. Ashley, Wilmington, Del., assignor to The Vision Group, Wilmington, Del.
Filed Sep. 24, 1979, Ser. No. 78,042
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86



263,777
DRAWER UNIT
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,239
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129



263,778
BATHROOM HOOK
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,246
Term of patent 14 years
Int. Cl. D8—*08;* D23—*02*
U.S. Cl. D6—120



263,779
COATHOOK
Pasquale Valli, Renate, Italy, assignor to Valli & Colombo S.p.A., Italy
Filed Feb. 27, 1980, Ser. No. 125,765
Claims priority, application Italy, Sep. 4, 1979, 22438 B/79
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—120

263,780

STAND FOR SUPPORTING SKIS AND POLES

Robert A. Hildebrand, 2290 Willow La., and David R. Cole, 3050 Quail St., both of Lakewood, Colo. 80215

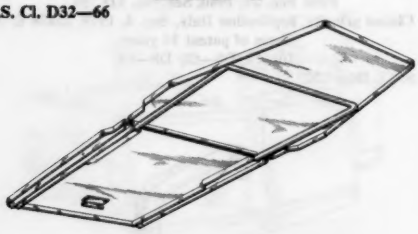
Filed Jun. 10, 1980, Ser. No. 158,233
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—24

263,781

FOLDABLE IRONING-BOARD

Dan A. B. Pettersson, Hillerstorp, Sweden, assignor to AB Jarnarmatur, Hillerstorp, Sweden

Filed May 4, 1978, Ser. No. 903,033
Claims priority, application Sweden, Nov. 8, 1977, 2274
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—66

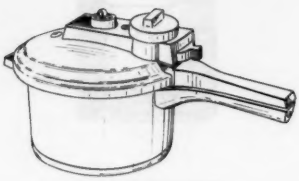


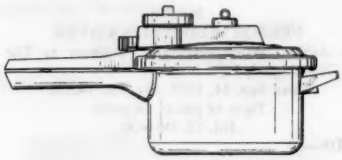
263,782

PRESSURE COOKER

Frederick P. Jackson, Barrowfield, and Brian Newell, Brierfield, both of England, assignors to The Prestige Group Limited, London, England

Filed Aug. 9, 1978, Ser. No. 932,414
Claims priority, application United Kingdom, Apr. 19, 1978, 984256
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—86





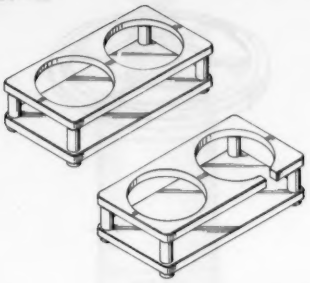
263,783

ELECTRIC BEVERAGE MAKER

Yasukichi Okazaki, and Tatsuo Okazaki, both of Kamifukuoka, Japan, assignors to Kabushikigaisha OMCO, Saitama, Japan

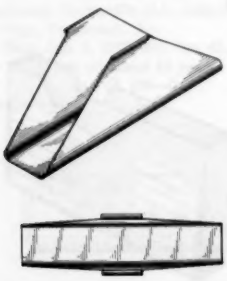
Filed Nov. 28, 1978, Ser. No. 964,422
Claims priority, application Japan, Aug. 23, 1978, 53-35653
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62

263,784
COMBINED COASTER AND ASH TRAY HOLDER
Lawrence G. Butler, 13221 Cordary St., Hawthorne, and Dorthea Means, 741 Eucalypus St., Apt. 1, Inglewood, both of Calif.
Filed Aug. 24, 1979, Ser. No. 69,288
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—71

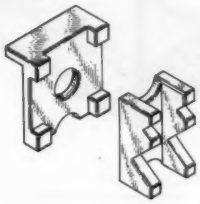


263,785
SOLAR COOKING APPARATUS
Gary J. Phillips, 3 Elsthorpe Ave., Gisborne, New Zealand
Filed Dec. 10, 1979, Ser. No. 101,413
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

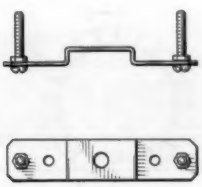
263,786
TACO SHELL HOLDER
Vivian J. Kohan, 210 Plainfield Ave., Pen Argyl, Pa. 18072
Filed Apr. 21, 1980, Ser. No. 142,214
Term of patent 14 years
Int. Cl. D07—*04, 99*
U.S. Cl. D7—105



263,787
PIPE-HOLDING VISE JAW APPLIANCE
Mario Testa, 612 Cambridge Ave., Menlo Park, Calif. 94025, and Arnold M. Testa, 384 Arboleda Dr., Los Altos, Calif. 94022
Filed May 1, 1978, Ser. No. 901,756
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74



263,788
UNIVERSAL MOUNTING BRACKET
Eugene T. McKinnon, 16536 Chattanooga Pl., Pacific Palisades, Calif. 90272, and Alvin S. Drutz, 11613 Clover Ave., Los Angeles, Calif. 90066
Filed Jul. 20, 1978, Ser. No. 926,549
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394

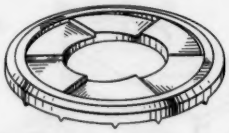


263,789
COMBINED WRENCH AND ANVIL
Ray A. Hatchell, 2310 Hampstead Ave., Richmond, Va. 23230
Filed Dec. 17, 1979, Ser. No. 104,618
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—26

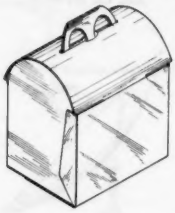
263,790
DOUBLE-BARREL GAS TORCH
Frank Baranowski, Jr., 7 Pine St., Lynnfield Center, Mass. 02174
Filed Dec. 28, 1979, Ser. No. 108,003
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

263,791
LOCK WASHER
Bengt O. Frieberg, 869 Picacho, La Habra Heights, Calif. 90631
Filed Jan. 28, 1980, Ser. No. 116,105
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—399

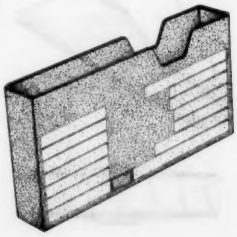
263,792
LOCK WASHER
Bengt O. Frieberg, 869 Picacho, La Habra Heights, Calif. 90631
Filed Mar. 21, 1980, Ser. No. 131,938
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—399



263,793
FOOD CARTON
Guion C. Magee, Gladstone, Mo., assignor to Alton Box Board Company, Alton, Ill.
Filed Oct. 25, 1978, Ser. No. 954,583
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

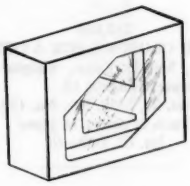


263,794
CASE FOR A MAGNETIC TAPE MAGAZINE
Keiichi Yoshizawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan
Filed Dec. 27, 1978, Ser. No. 974,134
Claims priority, application Japan, Jun. 30, 1978, 53-27796
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

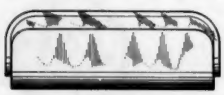


263,795
BOTTLE
Louis T. Pagels, Hanover Park, Ill., assignor to Automatic Liquid Packaging, Inc., Arlington Heights, Hl.
Filed May 3, 1979, Ser. No. 35,625
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

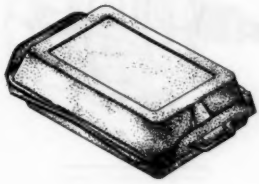
263,796
COMBINED PACKAGING AND DISPLAY BOX
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed May 31, 1979, Ser. No. 44,356
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—418



263,797
DISPLAY BOX
Roger P. Beauchamp, Harrisville, R.I., assignor to International Packaging Corp., Pawtucket, R.I.
Filed Jun. 4, 1979, Ser. No. 45,296
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



263,798
FOOD CONTAINER
Richard T. Edwards, Middletown, N.Y., assignor to Genpak Corporation, Middletown, N.Y.
Division of Ser. No. 808,249, Jun. 20, 1977. This application Jun. 11, 1979, Ser. No. 47,101
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—426

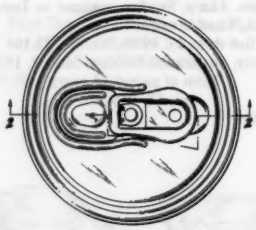


263,799
CAP FOR CONTAINER OR SIMILAR ARTICLE
Erling I. Nilsson, Akarp, Sweden, assignor to Tetra Pak Developpement SA, Lund, Sweden
Filed Aug. 27, 1979, Ser. No. 70,104
Claims priority, application Sweden, Mar. 2, 1979, 79000535
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—439

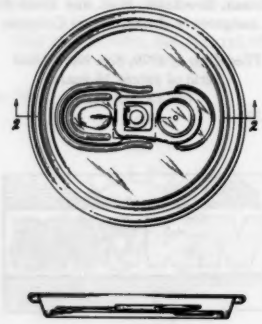
263,800
PACKAGING CONTAINER
John D. Angleman, Brookside, N.J., and Doris du Cret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Filed Oct. 1, 1979, Ser. No. 80,860
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—332

263,801
PACKING INSERT OR SIMILAR ARTICLE
David Lemberger, 129 Fair St., Palisades Park, N.J. 07650
Filed Oct. 25, 1979, Ser. No. 87,990
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—456

263,802
END CLOSURE FOR A CONTAINER
Ermal C. Fraze, 618 Greenmount Blvd., Dayton, Ohio 45419
Filed Nov. 5, 1979, Ser. No. 91,071
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—438

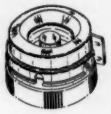


263,803
END CLOSURE FOR A CONTAINER
Ermal C. Fraze, 618 Greenmount Blvd., Dayton, Ohio 45419
Filed Nov. 5, 1979, Ser. No. 91,110
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—438

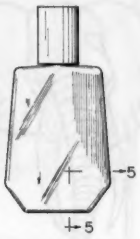


263,804
BOTTLE
Yukio Kondo, Yokohama, and Kurima Numata, Tokyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
Filed Nov. 28, 1979, Ser. No. 98,365
Claims priority, application Japan, Jun. 1, 1979, 54-22530
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—413

263,805
DISPENSING CLOSURE FOR A CONTAINER
Richard H. Seager, Mystic, Conn., assignor to King Seeley Thermos Co., Prospect Heights, Ill.
Filed Jan. 21, 1980, Ser. No. 113,530
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—450



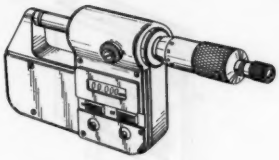
263,806
COMBINED BOTTLE AND CAP
John A. Grip, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 13, 1980, Ser. No. 121,193
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370



263,807
COSMETIC CONTAINER
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Mar. 10, 1980, Ser. No. 128,699
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—353

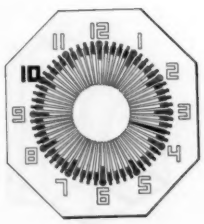
263,808
DISPLAY PANEL FOR A DIGITAL TIMEPIECE
Kiyoaki Tanaka, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kaisha, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan
Filed May 11, 1979, Ser. No. 38,159
Claims priority, application Japan, Nov. 13, 1979, 53-48300
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—124

263,809
MICROMETER
Hiroaki Suwa, and Kiyohiro Nakata, both of Hiromachi, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Oct. 11, 1979, Ser. No. 83,626
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

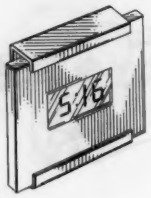


263,810
TIMEPIECE FACE
Tamara L. Snyder, R.D. #12, Hellam, York, Pa. 17406
Filed Feb. 25, 1980, Ser. No. 124,555
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

263,811
ELECTROOPTIC TIMEPIECE FACE DESIGN
Paul Hochstrate, Bristol, and Anthony D'Onofrio, West Hartford, both of Conn., assignors to Timex Corporation, Waterbury, Conn.
Filed Apr. 7, 1980, Ser. No. 137,656
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—123

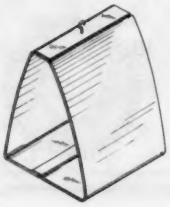


263,812
ADHESIVELY MOUNTED TIMEPIECE
Thomas J. Fuerneisen, Carefree, Ariz., assignor to Microtime, Incorporated, Scottsdale, Ariz.
Filed Apr. 25, 1980, Ser. No. 143,822
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



263,813
ARTIFACT HOLDING LOCKET
Sylvester Buschmann, Vienna, Mo. 65582
Filed Feb. 5, 1979, Ser. No. 9,302
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

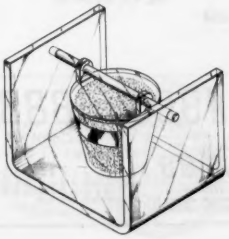
263,814
MOBILE
Paul E. Bechtold, 26 Kaywood Rd., Port Washington, N.Y. 11050
Filed Nov. 30, 1979, Ser. No. 92,231
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—141



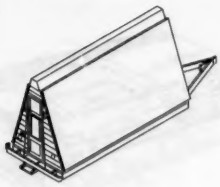
263,815
PENNANT
Larry B. Ornatek, 100 - 14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 116,046
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—166

263,816
JEWELRY PENDANT
Sion Dahan, P.O. Box 36917, Los Angeles, Calif. 90036
Filed Mar. 7, 1980, Ser. No. 128,042
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

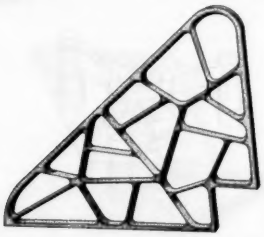
263,817
NOVELTY STATUETTE
Peter Scarpias, 6086 Via Reglia, San Diego, Calif. 92122
Filed Apr. 10, 1980, Ser. No. 139,000
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



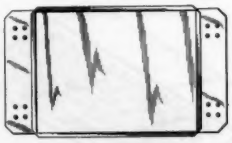
263,818
MOBILE HOME
Charles L. Porter, 302 Maple Island Rd., Burnsville, Minn. 55337
Filed Jul. 13, 1978, Ser. No. 924,459
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103

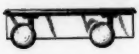


263,819
NOTCHED GRILL FOR A VAN WINDOW
Robert J. Kaplus, 4 Pewter La., New Providence, N.J. 07974, and Vincent Marchetti, 12 William St., Kearny, N.J. 07032
Filed Dec. 22, 1978, Ser. No. 972,413
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—183

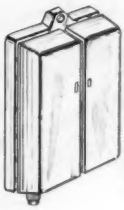


263,820
BUSINESS FORMS DOLLY
Alvin T. Levenberg, Baldwin, N.Y., assignor to Jefsteel Business Equipment Corp., Brooklyn, N.Y.
Filed Feb. 20, 1980, Ser. No. 122,830
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—23



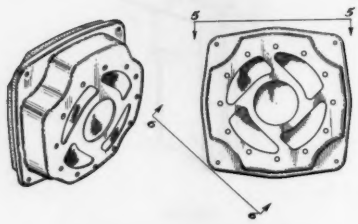


263,821
POWER LINE PROTECTOR OR THE LIKE
Thomas J. Smith, Bayshore, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.
Filed Jul. 9, 1979, Ser. No. 55,596
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—41

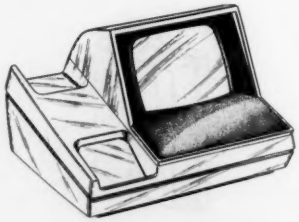


263,822
POWER LINE PROTECTOR OR THE LIKE
Thomas J. Smith, Bayshore, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.
Filed Jul. 9, 1979, Ser. No. 55,597
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—41

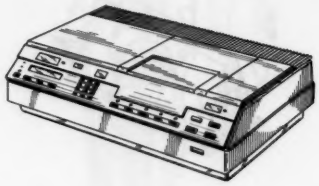
263,823
LOUDSPEAKER HOUSING OR SIMILAR ARTICLE
Robert B. Chapman, 12822 3rd Ave. S., Seattle, Wash. 98168
Filed Mar. 12, 1979, Ser. No. 19,487
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



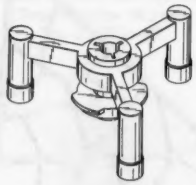
263,824
GENERAL-PURPOSE ELECTRONIC TELEPHONE SET BASE
David W. Hagelbarger, Morris Township, Morris County, and Peter S. Kubik, South Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jun. 28, 1979, Ser. No. 52,985
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—54



263,825
VIDEO CASSETTE RECORDER
John C. Speakman, Netersel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 30, 1979, Ser. No. 71,221
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—02



263,826
RECORD CLAMP
Brian D. Thurston, 285 W. 39th Ave., Vancouver, British Columbia, Canada V5Y 2P4
Filed Sep. 10, 1979, Ser. No. 73,951
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



263,827
COMPUTER KEYBOARD
John H. Pemberton, 9 Park View, Needingworth, Cambridge PE17 3TJ, England
Filed Oct. 11, 1979, Ser. No. 83,685
Claims priority, application United Kingdom, Apr. 12, 1979, 989490
Term of patent 14 years
Int. Cl. D14—*02;* D18—*01*
U.S. Cl. D14—100

263,828

PRINTOUT TERMINAL FOR COMPUTER

John H. Pemberton, 9 Park View, Needingworth, Cambridge PE17 3TJ, England

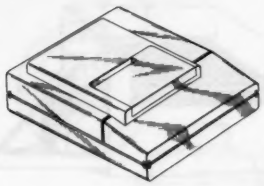
Filed Oct. 11, 1979, Ser. No. 83,686

Claims priority, application United Kingdom, Apr. 12, 1979, 989,493

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—111



263,829

VIDEO DISK PLAYER

Hiroshi Honjo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

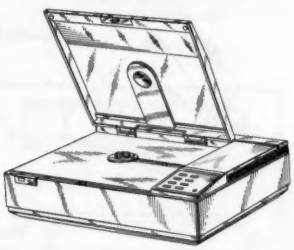
Filed Nov. 5, 1979, Ser. No. 90,910

Claims priority, application Japan, May 4, 1979, 54-018212

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—1



263,830

MICROPHONE FOR A VEHICULAR TELEPHONE SET OR SIMILAR ARTICLE

Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

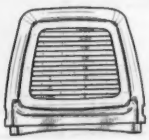
Filed Dec. 17, 1979, Ser. No. 104,051

Claims priority, application Japan, Jun. 26, 1979, 54-026387

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—12



263,831

FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE

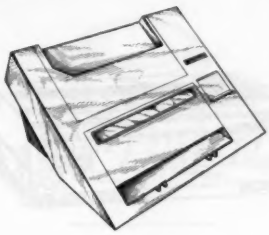
Lawrence E. Barbera, San Francisco, Calif.; John L. Connin, Longwood, Fla.; Michael E. Lawing, Columbus, and Dean W. Richardson, Worthington, both of Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 11, 1980, Ser. No. 120,303

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—94



263,832

CLOCK RADIO

Kwong C. Lee, North Point, Hong Kong, assignor to Edwah Electronics Limited, Shaukiwan, Hong Kong

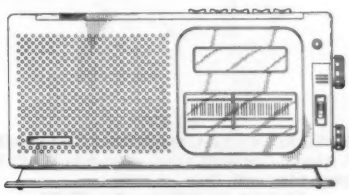
Filed Mar. 31, 1980, Ser. No. 136,453

Claims priority, application United Kingdom, Oct. 3, 1979, 991813

Term of patent 3½ years

Int. Cl. D14—*03*; D10—*01*

U.S. Cl. D14—73



263,833

VIDEO DISK PLAYER

Hiroshi Honjo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

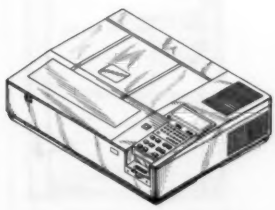
Filed Sep. 10, 1980, Ser. No. 185,783

Claims priority, application Japan, Mar. 19, 1980, 55-10911

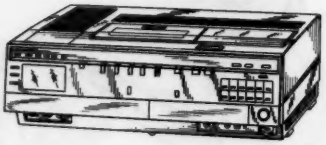
Term of patent 14 years

Int. Cl. D14—*01*

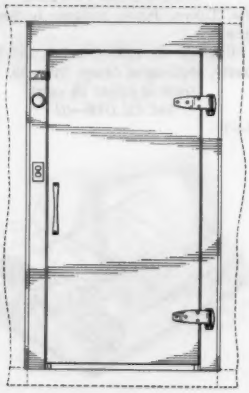
U.S. Cl. D14—1



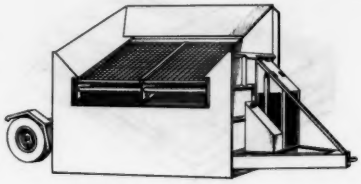
263,834
VIDEO TAPE RECORDER
Juhei Hayashi, Yokohama, and Koichi Tabata, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sep. 10. 1980, Ser. No. 185,784
Claims priority, application Japan, Mar. 13, 1980, 55-9803
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



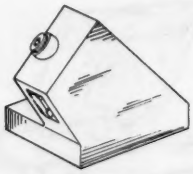
263,835
COMBINED REFRIGERATOR DOOR AND FRAME UNIT
John E. Ahrens, Cincinnati, Ohio, assignor to The C. Schmidt Company, Cincinnati, Ohio
Filed Feb. 21, 1978, Ser. No. 879,691
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—91



263,836
PORTABLE SCREENING PLANT
James L. Read, Halifax, Mass., assignor to F. T. Read & Sons, Inc., Rockland, Mass.
Filed Oct. 11, 1979, Ser. No. 83,971
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—147

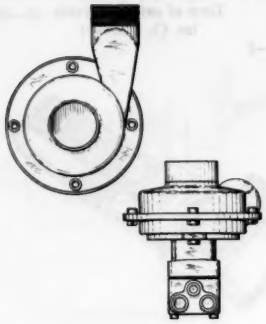


263,837
LATHE TOOL HOLDER
Howard A. Trelour, P.O. Box 86, Clarence Gardens, Australia (5039)
Filed Oct. 17, 1979, Ser. No. 85,517
Claims priority, application Australia, Apr. 23, 1979, 77677
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

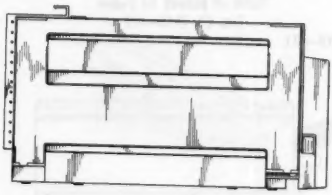


263,838
PLASTIC PIPE HEAT FUSION TOOL
Charles S. Villyard, 8 NW. 8th St., Oklahoma City, Okla. 73102
Filed Nov. 19, 1979, Ser. No. 95,220
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—144

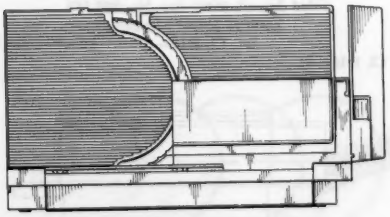
263,839
PUMP
Sigurd M. Somme, N Hjellestad, 5066 Hjellestad, Norway
Filed Nov. 19, 1979, Ser. No. 95,314
Claims priority, application Norway, Oct. 22, 1979, 60548
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



263,840
FOOD SLICER IN THE STORAGE POSITION
Joseph A. Rinaldi, Bergen County, N.J., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Dec. 3, 1979, Ser. No. 99,325
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—97

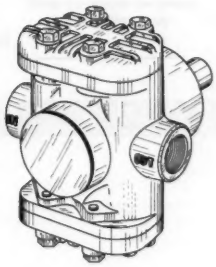


263,841
FOOD SLICER IN THE OPERATIONAL POSITION
Joseph A. Rinaldi, 651 Lake Ave., Oradell, N.J. 07649
Filed Dec. 3, 1979, Ser. No. 99,326
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—97



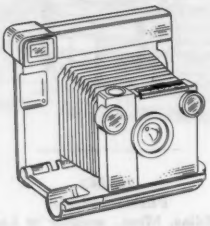
263,842
SUPPLY TANK FOR USE WITH A CARPET CLEANING MACHINE
Fred E. Pearman, Jr., Anderson, S.C., assignor to The Singer Company, Stamford, Conn.
Division of Ser. No. 870,954, Jan. 19, 1978, Pat. No. Des. 258,064. This application Dec. 10, 1979, Ser. No. 101,958
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—23

263,843
PISTON PUMP
Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 26, 1979, Ser. No. 106,450
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

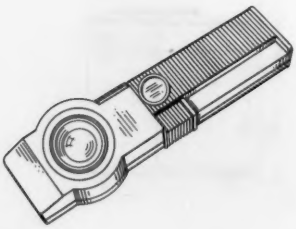


263,844
ELECTROPHOTOGRAPHIC APPARATUS
Mitsuru Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 10, 1979, Ser. No. 28,877
Claims priority, application Japan, Oct. 12, 1978, 53-43330
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

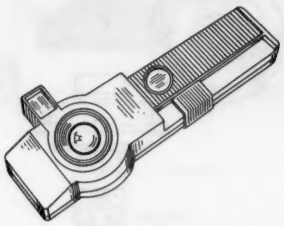
263,845
PHOTOGRAPHIC CAMERA
Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Karlheinz Rubner, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Nov. 1, 1979, Ser. No. 90,441
Claims priority, application Fed. Rep. of Germany, May 19, 1979, G162/79
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—5



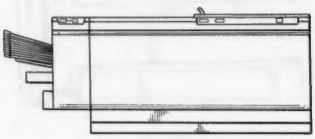
263,846
PHOTOGRAPHIC CAMERA
Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Karlheinz Rubner, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 10, 1979, Ser. No. 102,320
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, G163/79
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



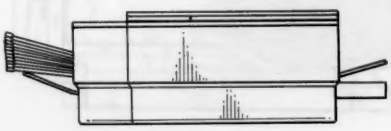
263,847
PHOTOGRAPHIC CAMERA
Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Karlheinz Rubner, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 10, 1979, Ser. No. 102,321
Claims priority, application Fed, Rep. of Germany, Sep. 6, 1979, G163/79
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



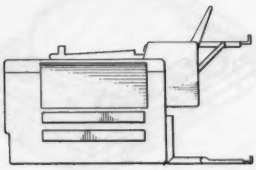
263,848
COPYING AND SORTING APPARATUS
R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Jun. 27, 1980, Ser. No. 163,473
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



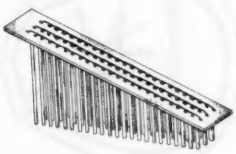
263,849
COPYING AND SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Jul. 14, 1980, Ser. No. 168,585
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



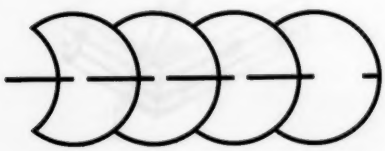
263,850
CONTINUOUS FORM FEEDING AND COPYING APPARATUS
R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Jul. 16, 1980, Ser. No. 169,355
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



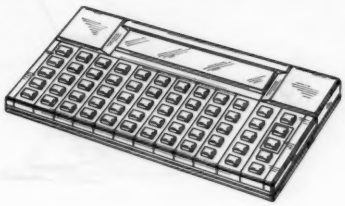
263,851
CHIME TYPE MUSICAL INSTRUMENT OR THE LIKE
Brian T. Trimmer, 915 McKimmon Rd., Fayetteville, N.C. 28303
Filed Nov. 20, 1978, Ser. No. 962,313
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22



263,852
POSITION MARKER
Thomas M. Gallub, Lindenhurst, N.Y., assignor to Fleit & Jacobson, Washington, D.C.
Filed Jun. 26, 1978, Ser. No. 919,219
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24

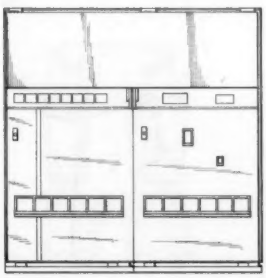


263,853
ELECTRONIC TRANSLATOR
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 27, 1980, Ser. No. 125,129
Claims priority, application Japan, Sep. 12, 1979, 54-38541
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

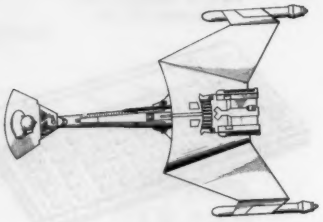


263,854
DECAL
James T. Calvert, 234 Valleyview Dr., R.R. #1, Churchill, Ontario, Canada L0L 1K0
Filed Dec. 4, 1978, Ser. No. 967,161
Term of patent 14 years
Int. Cl. D11—*99*
U.S. Cl. D20—11

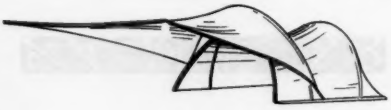
263,855
DISPLAY PANEL FOR A VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Homer C. Burrous, Atlanta, and Walter L. Shelton, Marietta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 12, 1979, Ser. No. 47,706
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—8



263,856
TOY SPACESHIP
Andrew G. Probert, El Segundo, Calif., assignor to Paramount Pictures Corporation, Los Angeles, Calif.
Filed May 7, 1979, Ser. No. 36,535
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

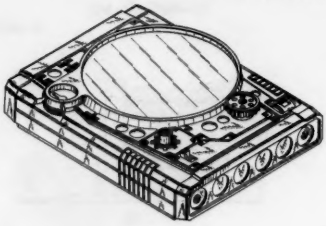


263,857
TENT FOR USE WITH TRUCK OR THE LIKE
Charles W. Moss, Moss Tent Works, Mt. Battie St., Camden, Me. 04843
Filed Jun. 25, 1979, Ser. No. 51,495
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253

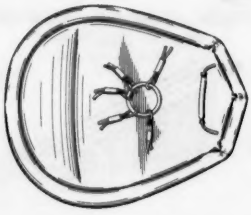


263,858
SPEED CONTROLLER FOR TOY CAR OR THE LIKE
Mun H. Ngai, 130-132 Argyle St., 3rd Floor, Flat C, Kowloon, Hong Kong
Filed Aug. 22, 1979, Ser. No. 68,542
Claims priority, application United Kingdom, May 29, 1979, 990086/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—141

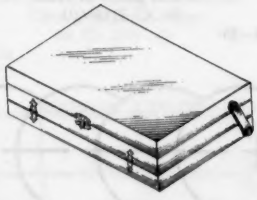
263,859
ELECTRONIC MISSILE GAME HOUSING
Hitoshi Itakura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 27, 1979, Ser. No. 79,302
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



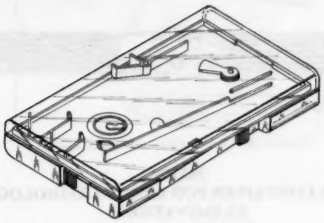
263,860
HAND SURF BOARD
Russell P. Cole, Rte. 1, Box 138A, Emory, Tex. 75440
Filed Oct. 9, 1979, Ser. No. 83,478
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—228



263,861
CONTAINER FOR ENCLOSING A BOARD GAME
Herbert L. Barber, 124 Riverdale Rd., Liverpool, N.Y. 13088
Filed Jan. 11, 1980, Ser. No. 109,889
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15

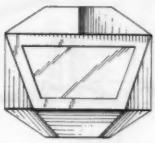


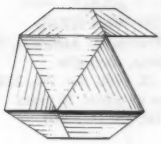
263,862
POCKET SIZE GAME BOX HAVING ROTATING STRIKING MEMBER
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 29, 1980, Ser. No. 116,487
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—9



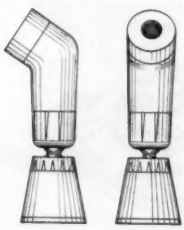
263,863
GAME BAT
Richard J. Golab, 7308 Balboa, Orlando, Fla. 32808
Filed Mar. 10, 1980, Ser. No. 128,722
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—211

263,864
STOVE
Richard L. Dillon, 13500 High Point Dr., Traverse City, Mich. 49684
Filed Nov. 19, 1979, Ser. No. 95,256
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

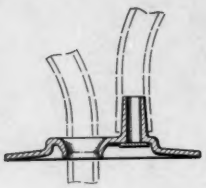




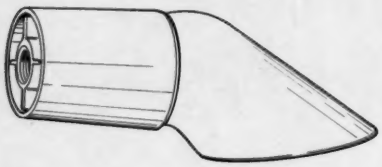
263,865
SHOWER HEAD
Amilcar F. Yamin, Rodovia Presidente Dutra Km. 380 (trevo Bonsucesso), Guarulhos Estado de Sao Paulo, Brazil
Filed Nov. 23, 1979, Ser. No. 97,113
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



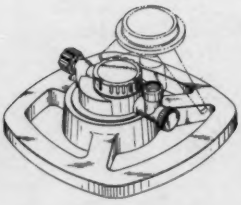
263,866
FITTING FOR SYPHONING FUEL
Ronald L. Messenger, 10747 Mount Vernon Rd., Auburn, Calif. 95603
Filed Jan. 29, 1980, Ser. No. 116,441
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—27



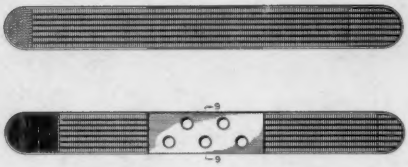
263,867
SHOWER HEAD
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 22, 1980, Ser. No. 123,746
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



263,868
WATER SPRINKLER BASE
Ho Chow, River Edge, N.J., and Tim M. Uyeda, South San Gabriel, Calif., assignors to Beatrice Foods Co., Moonachie, N.J.
Filed May 1, 1980, Ser. No. 145,797
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

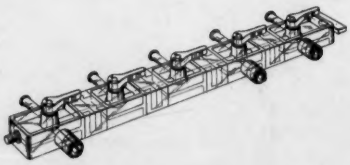


263,869
MEDICAL MAGNETIC BAND
Noriaki Sumiyasu, Tokyo, Japan, assignor to IDR Electronics Co., Ltd., Tokyo, Japan
Filed Nov. 3, 1978, Ser. No. 957,282
Claims priority, application Japan, May 10, 1978, 53-18999
Term of patent 14 years
Int. Cl. D24—*02;* D28—*03*
U.S. Cl. D24—99

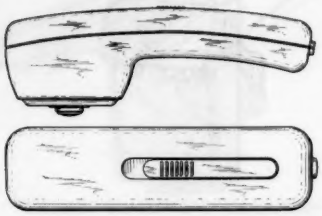


263,870
FLEXIBLE CONTAINER FOR BARIUM RADIOLOGICAL EXAMINATIONS
Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company, Inc., Westbury, N.Y.
Filed Dec. 11, 1978, Ser. No. 968,475
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56

263,871
MEDICAL MULTIPORT VALVE COCK
Iwao Matsuura, Osaka, Japan, assignor to Nissho Corporation, Osaka, Japan
Filed Apr. 16, 1979, Ser. No. 30,640
Term of patent 14 years
Int. Cl. D23—*01;* D24—*02*
U.S. Cl. D24—53



263,872
HOUSING FOR A MASSAGER/VIBRATOR
William J. Rakocy, Nutley, N.J., and Howard L. Rauch, Brooklyn, N.Y., assignors to North American Philips Corp., New York, N.Y.
Filed Apr. 30, 1979, Ser. No. 34,707
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



263,873
FLEXIBLE STYLET
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 3, 1979, Ser. No. 35,567
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

263,874
FLEXIBLE STYLET
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 3, 1979, Ser. No. 35,568
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

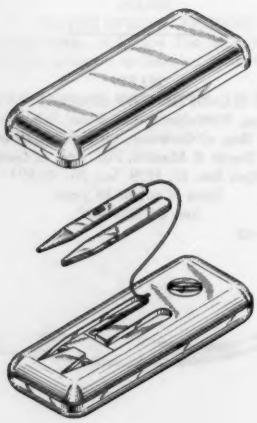
263,875
FLEXIBLE STYLET
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 3, 1979, Ser. No. 35,748
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

263,876
REAGENT CASSETTE
Glenn S. Beidler, Vicksburg; Leighton C. Johnson, Edwardsburg, both of Mich., and Mohammad A. Kheiri, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jun. 18, 1979, Ser. No. 49,445
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29

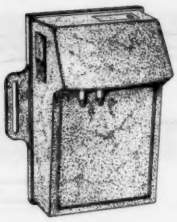
263,877
DENTAL HANDPIECE OR SIMILAR ARTICLE
Werner Podszus, Weissenohe, and Peter Schoeller, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 19, 1979, Ser. No. 49,894
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

263,878
ROOT CANAL SCREW
Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden
Filed Jul. 24, 1979, Ser. No. 60,404
Term of patent 14 years
Int. Cl. D24—*02*; D8—*02*
U.S. Cl. D24—16

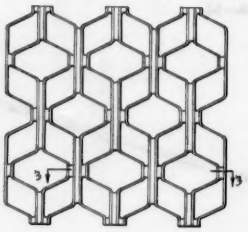
263,879
ELECTROLYSIS HAIR REMOVAL KIT
Samuel J. Mann, Englewood, N.J., assignor to Inverness International, Englewood, N.J.
Filed Aug. 30, 1979, Ser. No. 70,767
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



263,880
OBSTETRICAL TELEMETRY INSTRUMENT ENCLOSURE
Stephen A. Francis, Meriden, Conn., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 13, 1979, Ser. No. 75,382
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

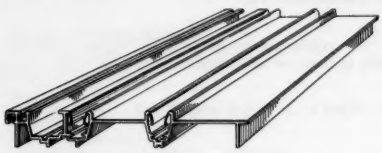


263,881
EXPANDED PANEL OF EXTRUDED METAL
William L. Jury, Royal Park, Australia, assignor to John McIlwraith Industries Ltd., Royal Park, Australia
Filed Mar. 28, 1980, Ser. No. 134,791
Claims priority, application Australia, Oct. 2, 1979, 79,142
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26

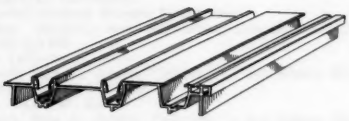


263,882
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, P.Q., Canada
Filed Apr. 30, 1980, Ser. No. 145,137
Claims priority, application France, Nov. 14, 1979, 79 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

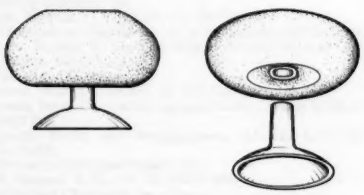
263,883
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,256
Claims priority, application France, Nov. 14, 1979, 79 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



263,884
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,257
Claims priority, application France, Nov. 14, 1979, 79 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

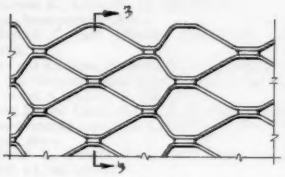


263,885
COMBINED SOAP BAR AND HOLDER
Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48034
Filed Jul. 25, 1979, Ser. No. 60,279
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—8.1

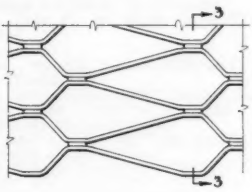


263,886
STYLING COMB
John E. Soltsick, Jr., 929 Joann St., Costa Mesa, Calif. 92627
Filed Mar. 31, 1980, Ser. No. 135,472
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—21

263,887
EXPANDED PANEL OF EXTRUDED METAL
William L. Jury, Royal Park, Australia, assignor to John McIlwraith Industries Ltd., Royal Park, Australia
Filed Mar. 28, 1980, Ser. No. 134,754
Claims priority, application Australia, Oct. 16, 1979, 79279
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



263,888
EXPANDED PANEL OF EXTRUDED METAL
William L. Jury, Royal Park, Australia, assignor to John McIlwraith Industries Ltd., Royal Park, Australia
Filed Mar. 28, 1980, Ser. No. 134,894
Claims priority, application Australia, Oct. 16, 1979, 79,281
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



263,889
CUSTOMER FINANCIAL TRANSACTION TERMINAL FOR DRIVE-UP BANKING AND THE LIKE
George G. Lippisch, Cedar Rapids, Iowa, assignor to Kidde, Inc., Clifton, N.J.
Filed Aug. 20, 1979, Ser. No. 67,729
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—28

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF APRIL, 1982

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Welstead, William J., Jr., 4,324,791, Cl. 424-267.000.

Ab, Emil A. Ion accelerator and a method for increasing its efficiency. 4,325,005, Cl. 315-111.810.

AB Volvo: *See*—
Johansson, Nils L.; and Wciertz, Stig H. A., 4,324,149, Cl. 74-473.00R.

Abbott Laboratories: *See*—
Cross, Marvin G., 4,324,242, Cl. 128-232.000.
Genese, Joseph N.; and Muetterties, Andrew J., 4,324,238, Cl. 128-214.00G.

Abe, Yuuhei; and Mohri, Katsuo, to Hitachi, Ltd. Programmed timer for VTR. 4,325,081, Cl. 358-127.000.

Abnett, Albert C.; and Towns, Mark E. Circuit for measuring the horsepower per cylinder for an engine. 4,325,128, Cl. 364-511.000.

Acco Industries, Inc.: *See*—
Sevrence, Warren E., 4,324,503, Cl. 403-197.000.

Accraply, Inc.: *See*—
Sherwick, Steven P.; Leapley, David G.; and Vonderhorst, James P., 4,324,058, Cl. 40-310.000.

ACF Industries, Inc.: *See*—
Green, William A., 4,324,746, Cl. 261-51.000.

Acharya, Vikramkumar; and Lakshmanan, Pallavoor R., to Gulf Oil Corporation. Hot melt adhesive compositions containing a terpene-phenolic resin, ethylene copolymer and alkenyl succinic anhydride. 4,324,871, Cl. 525-149.000.

Adamovske Strojirny, Narodni Podnik: *See*—
Jiruse, Jaroslav; and Svobodova, Antonin, 4,324,180, Cl. 101-216.000.

Adams, Catherine L.: *See*—
Smith, Juan A.; Adams, Catherine L.; and Adams, Wayne M., 4,324,004, Cl. 2-131.000.

Adams, Wayne M.: *See*—
Smith, Juan A.; Adams, Catherine L.; and Adams, Wayne M., 4,324,004, Cl. 2-131.000.

Adebono Brake Industry Co., Ltd.: *See*—
Tabe, Yutaka; Takamoto, Hiromitsu; Shimada, Keizo; and Sugita, Yasusaburo, 4,324,706, Cl. 523-149.000.

Adelski, Hans-Joachim; and Volkrodt, Wolfgang, to Siemens Aktiengesellschaft. Interior rotor for an electric machine. 4,324,996, Cl. 310-156.000.

Adin, Anthony; and Fleming, James C., to Eastman Kodak Company. Transition metal photoreduction systems and processes. 4,324,852, Cl. 430-178.000.

Aebi, Rudolf: *See*—
Vogel, Christian; and Aebi, Rudolf, 4,324,580, Cl. 71-118.000.

Aeroquip Corporation: *See*—
Upham, Neil R.; and Rogers, Russell L., 4,324,407, Cl. 277-27.000.

Aetna Bearing Company: *See*—
Dagiel, Richard T., 4,324,443, Cl. 308-187.100.

Agence Nationale de Valorisation de le Recherche (ANVAR): *See*—
Garnier, Jacques P.; Garnier, Marcel A.; and Moreau, Rene J., 4,324,266, Cl. 137-13.000.

AGFA-Gevaert AG: *See*—
Becherer, Walter, 4,324,481, Cl. 354-324.000.
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, 4,324,463, Cl. 354-25.000.
Rossbach, Horst; and Wagensonner, Eduard, 4,324,465, Cl. 354-25.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Wick, Richard, 4,324,464, Cl. 354-25.000.

Air Products and Chemicals, Inc.: *See*—
Lovette, Norris G., Jr.; and Ruprecht, David R., 4,324,110, Cl. 62-381.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Kono, Yasuaki; and Arai, Hisaharu, 4,324,745, Cl. 261-39.00E.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,324,137, Cl. 73-362.0CP.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; Hashimoto, Nobuyuki; and Satomoto, Atsushi, 4,325,047, Cl. 337-370.000.

Akasaki, Isamu; Ohsima, Masaaki; Matsuda, Nobuhide; Matsuki, Michio; Tsukamoto, Yoshio; Kagi, Hiromichi; and Fukazawa, Hidehalu, to Matsushita Electric Ind. Co., Ltd.; and Matsushita Graphic Communication Systems, Inc. Recording head for facsimile receivers. 4,325,070, Cl. 346-108.000.

Akisada, Masahide: *See*—
Fukushima, Osamu; Akisada, Masahide; and Koizumi, Takashi, 4,324,478, Cl. 354-312.000.

Akro Corporation, The: *See*—
Narens, Daniel S.; and Reuben, Harold, 4,324,824, Cl. 428-92.000.

Akzona Incorporated: *See*—
Bronner, Jurgen, 4,324,749, Cl. 261-112.000.
Varga, Julianna K., 4,324,593, Cl. 106-203.000.

Alarma Systems Incorporated: *See*—
Davis, Bayard C.; and Heyden, Donald H., 4,324,138, Cl. 73-341.000.

Albarda, Scato; and Kuijpers, Martinus H., to U.S. Philips Corporation. Device for the transcutaneous measurement of the partial oxygen pressure in blood. 4,324,257, Cl. 128-635.000.

Albright, David B.; and Conti, Joseph A., to Pitney Bowes Inc. Sheet separating and feeding apparatus. 4,324,396, Cl. 271-125.000.

Alderson, Barry: *See*—
Senior, Peter J.; Wright, Leonard F.; and Alderson, Barry, 4,324,907, Cl. 560-185.000.

Alexander, Joseph H.; and Jellison, Frank R., to General Tire & Rubber Co., The. Bead setting apparatus with retractable flange. 4,324,604, Cl. 156-131.000.

Alfa-Laval AB: *See*—
Sarebjork, Karl W. H.; and Pallmar, Anders B., 4,324,735, Cl. 260-425.000.

Alfa Romeo S.p.A.: *See*—
Garcea, Giampaolo, 4,324,214, Cl. 123-309.000.

Allan, Thomas T.: *See*—
Wilcox, David E.; and Allan, Thomas T., 4,324,568, Cl. 55-97.000.

Allebone, Brian H., to BICC Limited. Leaky coaxial cable wherein aperture spacings decrease along the length of the cable. 4,325,039, Cl. 333-237.000.

Allen-Bradley Company: *See*—
Woodliff, Ronald D.; Paape, Kenneth L.; and Johnston, Edwin S., 4,324,424, Cl. 285-158.000.

Allied Corporation: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,324,773, Cl. 423-311.000.
Stephenson, Robert L., 4,324,418, Cl. 280-802.000.

Allis-Chalmers Corporation: *See*—
Ferro, Anthony J., 4,324,383, Cl. 251-308.000.
Schroeder, Earle E.; and Baker, James E., 4,324,533, Cl. 417-360.000.

Alser, James J.: *See*—
Smith, Lori J.; and Alser, James J., 4,324,066, Cl. 46-165.000.

Altenschopfer, Theodor: *See*—
Kaufmann, Jochen; Altenschopfer, Theodor; Schumann, Klaus; and Rings, Friedel, 4,324,677, Cl. 252-99.000.

Alumina Development Corporation: *See*—
McDaniel, James W., 4,324,769, Cl. 423-121.000.

Aluminum Company of America: *See*—
Ashford, R. Daniel, 4,324,136, Cl. 73-159.000.

Amax Inc.: *See*—
Barlow, E. W.; and Neelameggham, Ramaswami, 4,324,771, Cl. 423-283.000.

Amerchol Corporation: *See*—
Seldner, Abraham, 4,324,703, Cl. 252-522.00R.

American Bottlers Equipment Company, Inc.: *See*—
Fauth, Frederick E., 4,324,265, Cl. 134-82.000.

American Cyanamid Company: *See*—
Deb, Satyendra K., 4,324,622, Cl. 430-63.000.
Weston, Norma A.; and Schurdak, Edward J., 4,324,682, Cl. 252-301.270.

American Home Products Corporation: *See*—
Scotese, Anthony C.; and Santilli, Arthur A., 4,324,893, Cl. 544-127.000.
Stein, Reinhardt P., 4,324,897, Cl. 548-125.000.

American Hospital Supply Corporation: *See*—
Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., 4,324,548, Cl. 433-126.000.

American Standard Inc.: *See*—
Grundy, Reed H., 4,325,101, Cl. 361-195.000.
Kuhn, John J., 4,324,376, Cl. 246-125.000.

Amiet AG: *See*—
Gisiger, Urs, 4,324,120, Cl. 70-312.000.

Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., to Elfab Corporation. Card edge connector with pull through bellows contact and lay-over insulator. 4,324,451, Cl. 339-176.0MP.

AMP Inc.: *See*—
Weisenburger, Lawrence P.; and Delguidice, Henry L., 4,324,450, Cl. 339-97.00R.

Ampex Corporation: *See*—
Griesshaber, Karl H., 4,325,082, Cl. 358-218.000.

Ancra Corporation: *See*—
Prete, Ernest, Jr., 4,324,022, Cl. 24-68.0CD.
Prete, Ernest, Jr., 4,324,023, Cl. 24-68.0CD.

Andersen, Henning H., to U.S. Philips Corporation. Device for displaying an analog signal on a display screen. 4,325,009, Cl. 315-386.000.
Anderson Company of Indiana, The: *See*—
Mohnach, Michael G.; and Harbison, William H., 4,324,019, Cl. 15-250.320.
Anderson, Eugene R. Material and method to dissociate water at controlled rates. 4,324,777, Cl. 423-579.000.
Anderson, Larry D.: *See*—
Houlberg, Don M.; Anderson, Larry D.; and Damico, Frank M., 4,324,010, Cl. 5-68.000.
Anderson, Richard D.; Harvey, Ronald B.; Knudsen, Randall C.; and Wedel, John A., to Pako Corporation. Floating edge-follower bordered paper mask. 4,324,488, Cl. 355-74.000.
Ando, Naoyoshi: *See*—
Ito, Kanichi; Hirayama, Yoshio; Ishii, Yoshiaki; and Ando, Naoyoshi, 4,324,620, Cl. 202-89.000.
Ando, Noriaki: *See*—
Furuichi, Minoru; Honma, Chikara; and Ando, Noriaki, 4,324,866, Cl. 521-140.000.
Andreas Stihl, Firma: *See*—
Hoppner, Klaus; and Wolf, Gunter, 4,324,045, Cl. 30-381.000.
Andrew Master Hones Limited: *See*—
Sharkey, Robert L., 4,324,534, Cl. 417-414.000.
Andrex N.D.T. Products (U.K.) Limited: *See*—
Sandbank, Hans A., 4,324,336, Cl. 209-589.000.
Angevine, Philip J.; and Stein, Thomas R., to Mobil Oil Corporation. Upgrading residual oil. 4,324,645, Cl. 208-50.000.
Anliker, Max: *See*—
Huebscher, Werner; and Anliker, Max, 4,324,258, Cl. 128-663.000.
Anthony, Myron L., to Sax Zzyzx, Ltd. Production of algae. 4,324,068, Cl. 47-1.400.
Anvil Attachments, Inc.: *See*—
Lane, John; and Tu, Jerry C., 4,324,525, Cl. 414-699.000.
Aoki, Shin-Ichi; and Takeya, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Windmill-shaped electrode for vacuum circuit interrupter. 4,324,960, Cl. 200-144.00B.
Aoki, Shinji; Ishikawa, Ryuichi; and Sawada, Yasuhiro, to Ebara Corp; and Japan Iron and Steel Federation. Apparatus for treating waste gas by irradiation with electron beams. 4,324,759, Cl. 422-62.000.
Aoyama, Syunichi, to Nissan Motor Company, Limited. Hydraulic valve lifter and fluid pressure control device therefor. 4,324,210, Cl. 123-90.550.
Appl, Max: *See*—
Pforr, Gerhard; Peschau, Gerhard; Schippmann, Guenter; Appl, Max; Voelkl, Erfried; and Stark, Hans, 4,324,570, Cl. 55-267.000.
Applied Biochemists, Inc.: *See*—
Seymour, Donald E.; Seymour, Greg A.; and Jaber, Mark J., 4,324,578, Cl. 71-67.000.
Apri, Edward W. Clamp. 4,324,025, Cl. 24-261.00R.
Arai, Hisaharu: *See*—
Kono, Yasuaki; and Arai, Hisaharu, 4,324,745, Cl. 261-39.00E.
Arcan, Mircea; and Heinrich, Benedict, to Vishay Intertechnology, Inc. Dentistry technique. 4,324,547, Cl. 433-71.000.
Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the manufacture of ethers of hydroxy-pivalaldehyde. 4,324,921, Cl. 568-427.000.
Aruga, Taketo; Morita, Koichi; Hoshi, Kenzo; and Kojima, Yasuo, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit for a hydraulically driven vehicle. 4,324,098, Cl. 60-420.000.
Arzoumanidis, Gregory G.; and Lee, Sam S., to Standard Oil Company (Indiana). Olefin polymerization catalyst. 4,324,693, Cl. 252-429.00B.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Tano, Eiichi; and Suzuki, Koji, 4,324,462, Cl. 354-23.00D.
Tano, Eiichi; and Suzuki, Koji, 4,324,468, Cl. 354-149.000.
Tomori, Yasumasa, 4,324,457, Cl. 350-430.000.
Asakura, Kouichi; and Okamoto, Toyoo, to Ricoh Company, Ltd. Electrostatic copying apparatus. 4,324,485, Cl. 355-8.000.
ASEA Aktiebolag: *See*—
Stenkvist, Sven-Einar; and Rappinger, Bo, 4,324,943, Cl. 373-72.000.
Ashford, R. Daniel, to Aluminum Company of America. Beta gauge mechanism. 4,324,136, Cl. 73-159.000.
Atari, Inc.: *See*—
Stubben, David R.; and Rains, Lyle V., 4,324,401, Cl. 273-85.00G.
Ateliers et Chantiers de Bretagne ACB: *See*—
Cojean, Maurice; and Colin, Jean-Paul, 4,324,385, Cl. 254-270.000.
Athanasiades, Neocles: *See*—
McLoughlin, John; Athanasiades, Neocles; and Rotblum, Yehuda, 4,324,294, Cl. 169-13.000.
Athearn, Lee F., to Medtronic, Inc. Lithium anode assemblies and cell construction. 4,324,847, Cl. 429-181.000.
Atlantic Richfield Company: *See*—
Wilkes, Donald F., 4,324,414, Cl. 280-242.0WC.
Atom Chemical Paint Co., Ltd.: *See*—
Tanaka, Tsugio; Hashimoto, Kohichi; and Nagasaka, Yukio, 4,324,711, Cl. 523-172.000.
Audesse, Emergy G.: *See*—
Broadt, David R.; and Audesse, Emergy G., 4,325,104, Cl. 362-11.000.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Schneeweiss, Manfred; Gotzenberger, Adolf; and Ohm, Aloys, 4,324,416, Cl. 280-661.000.
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Kuehn, John P., 4,325,132, Cl. 369-256.000.
Auld, Bertram A., to United States of America, Navy. Electronically simulated rotating prism for ultrasonic beam scanning. 4,324,140, Cl. 73-602.000.
Auphan, Michel J.; and Baghuis, Ludo C. J., to U.S. Philips Corporation. Circuit for processing the signals received by a mosaic of ultrasonic transducers in B-mode echography. 4,324,142, Cl. 73-626.000.
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Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,324,728, Cl. 260-345.200.
Axen, Udo F.; and Sih, John C., to Upjohn Company, The. 2,5-Inter-o-phenylene-3,4-dinor-6,9α-epoxy-6β-5-iodo-PGF_1 amides. 4,324,889, Cl. 542-426.000.
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Sato, Yasushi; Saito, Seiji; and Ayata, Naoki, 4,325,086, Cl. 358-296.000.
Aziz, Mohammed I., to Procter & Gamble Company, The. Disposable absorbent article having an absorbent core and a topsheet. 4,324,247, Cl. 128-287.000.
B. F. Goodrich Company, The: *See*—
Born, John W., 4,324,146, Cl. 73-863.120.
Layer, Robert W., 4,324,717, Cl. 524-244.000.
B/K Patent Development, Inc.: *See*—
Burch, Hadley K., 4,325,046, Cl. 337-56.000.
Babcock & Wilcox Company, The: *See*—
Schluderberg, Donald C., 4,324,618, Cl. 376-434.000.
Bach, Huynh Thien. Fluid pressure balancing and mixing valve. 4,324,267, Cl. 137-100.000.
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Baier, Robert J.; and Glatfelter, Edward W., to Gulf & Western Corporation. Feed arrangement for and method of continuously feeding cigars wrappers to cigar wrapping stations of cigar wrapping machines. 4,324,233, Cl. 128-58.000.
Baker, James E.: *See*—
Schroeder, Earle E.; and Baker, James E., 4,324,533, Cl. 417-360.000.
Bakke, Even, to Peabody Process Systems, Inc. Process for dry scrubbing of flue gas. 4,324,770, Cl. 423-242.000.
Ballard, Denis G.; Charnah, Richard M.; Droughton, John F.; and Rideal, Graham R., to Imperial Chemical Industries Limited. Dry powder compositions of vermiculite lamellae and additives. 4,324,838, Cl. 428-402.000.
Balteau Sonatest Limited: *See*—
Stearn, Richard J., 4,324,141, Cl. 73-627.000.
Balzer, David J.; and Kessinger, Orville E., to Caterpillar Tractor Co. Equalizer bar support assembly. 4,324,303, Cl. 180-9.500.
Bandag Incorporated: *See*—
Dugger, Doyle, 4,324,607, Cl. 156-350.000.
Baniel, Avraham M., to Fertilizer Development S.A. Method for the manufacture of defluorinated phosphatic products. 4,324,774, Cl. 423-321.00R.
Bankes, Kristen E.; Large, Donald M.; Reinhard, Fred J.; and Tamashasky, Joseph A., to Western Electric Co., Inc. Introducing elongated magnetic articles into vacant positions on a carrier. 4,324,600, Cl. 156-64.000.
Bannister, Wayne O. Heat reclaiming system. 4,324,359, Cl. 237-46.000.
Bansch, Daniel R.: *See*—
Ross, Robert R.; and Bansch, Daniel R., 4,324,106, Cl. 62-197.000.
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Matsuzaki, Meiki; Okabe, Hiroshi; Tanaka, Seishiro; Takiguchi, Takao; and Onodera, Kunikatsu, 4,324,801, Cl. 424-311.000.
Barach, John P.; and Wikswo, John P., Jr. Method and apparatus for measuring magnetic fields and electrical currents in biological and other systems. 4,324,255, Cl. 128-630.000.
Baranowski, Frank, Jr. Pressure regulator. 4,324,269, Cl. 137-315.000.
Barbery, Gilles: *See*—
Henchiri, Amar; Cecile, Jean-Luc; Baudet, Gerard; Barbery, Gilles; and Bloise, Rene, 4,324,653, Cl. 209-167.000.
Barbour, William P., to Security Imprinter Corporation. Imprinting machine with wheel setting rack mechanism. 4,324,178, Cl. 101-45.000.
Barlow, E. W.; and Neelameggham, Ramaswami, to Amax Inc. Alcohol & hydroxyoxime extractant for boron & calcium from brines. 4,324,771, Cl. 423-283.000.
Barnett, Richard E.: *See*—
Ooms, William J.; and Barnett, Richard E., 4,325,031, Cl. 331-1.00A.

Barr & Stroud Limited: *See*—
Purdie, Anthony F., 4,324,475, Cl. 356-352.000.
Barrett Burston (Australia) Limited: *See*—
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Barrons, Keith C.: *See*—
Holmsen, Theodore W.; Barrons, Keith C.; and Smith, Leonard L., Jr., 4,324,581, Cl. 71-126.000.
Barthold, Klaus; and Liebold, Gert, to BASF Aktiengesellschaft. Protective additive for radiators in coolants containing water. 4,324,675, Cl. 252-79.000.
Bartmann, Bernhard, to J. M. Voith GmbH. Double drum winder. 4,324,369, Cl. 242-66.000.
Bartunek, William; Kaye, Gordon E.; and Mallory, Henry R., to Duracell International Inc. One piece battery holder. 4,325,106, Cl. 362-157.000.
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Blinne, Gerd; Wurmb, Rolf; and Schmidt, Franz, 4,324,881, Cl. 528-173.000.
Hagen, Helmut; Reuther, Wolfgang; and Pommer, Ernst-Heinrich, 4,324,793, Cl. 424-270.000.
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, 4,324,725, Cl. 260-343.600.
Lechtken, Peter; Buethe, Ingolf; and Hesse, Anton, 4,324,744, Cl. 260-932.000.
Merger, Franz; and Nestler, Gerhard, 4,324,727, Cl. 260-343.600.
Mross, Wolf D.; Titzenthaler, Eckart; Koopmann, Juergen; Vogt, Volker; and Schwarzmann, Matthias, 4,324,699, Cl. 252-463.000.
Mueller, Hans; Wulz, Klaus; Beyer, Karl-Heinz; and Streit, Werner, 4,324,724, Cl. 260-239.00E.
Pforr, Gerhard; Peschau, Gerhard; Schippmann, Guenter; Appl, Max; Voelkl, Erfried; and Stark, Hans, 4,324,570, Cl. 55-267.000.
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, 4,324,694, Cl. 252-435.000.
BASF Wyandotte Corporation: *See*—
Patton, John T., Jr.; and Rupert, John P., 4,324,867, Cl. 521-159.000.
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Craft, William K., 4,324,026, Cl. 27-1.000.
Battelle Memorial Institute: *See*—
Bergmann, Erich; and Melet, Georges, 4,324,803, Cl. 428-472.000.
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Bauer, Werner R.; and Van Fossen, Robert A., to Robertshaw Controls Company. Reversing valve construction and piston head assembly therefor and methods of making the same. 4,324,273, Cl. 137-625.430.
Bauerle, James E.: *See*—
Hrizo, John; Bauerle, James E.; and Witkowski, Robert E., 4,325,029, Cl. 324-468.000.
Baum, Harold D. Attraction and entertainment device for a vending machine. 4,324,059, Cl. 40-416.000.
Baumbach, Bertram W., to Reliable Electric Company. Line protector for a communications circuit. 4,325,100, Cl. 361-119.000.
Baxter Travenol Laboratories, Inc.: *See*—
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Bayer Aktiengesellschaft: *See*—
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, 4,324,879, Cl. 528-45.000.
Dahm, Manfred; Jabs, Gert; and Wegner, Christian, 4,324,817, Cl. 427-150.000.
Dhein, Rolf; Reuter, Knud; Rudolph, Hans; and Pfitzner, Jorg, 4,324,880, Cl. 528-80.000.
Eimers, Erich; and Dhein, Rolf, 4,324,934, Cl. 585-21.000.
Jupe, Christoph; Waldmann, Helmut; and Seifert, Hermann, 4,324,925, Cl. 568-719.000.
Majer, Norbert; and Boehmke, Gunther, 4,324,732, Cl. 260-377.000.
Reischl, Artur; and Jabs, Gert, 4,324,716, Cl. 524-761.000.
Schulz, Hans H.; Uerdingen, Walter; and Wagner, Kuno, 4,324,590, Cl. 106-35.000.
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,324,722, Cl. 260-207.000.
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,324,723, Cl. 260-207.100.
Wedemeyer, Karlfried; and Kienitz, Lutz, 4,324,913, Cl. 564-410.000.
BBC Brown, Bovari & Company, Limited: *See*—
Berchtold, Max; and Jenny, Ernst, 4,324,526, Cl. 415-48.000.
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Bloch, Heinz, 4,324,103, Cl. 60-663.000.
Beach, Earl; and Matle, Calvin, to Ross Operating Valve Company. Muffler. 4,324,314, Cl. 181-230.000.
Beall, Robert. Compartmented container. 4,324,338, Cl. 215-6.000.
Beauchamp, Jesse L.; and George, Patricia M., to California Institute of Technology. Deposition of metal films and clusters by reactions of compounds with low energy electrons on surfaces. 4,324,854, Cl. 430-296.000.
Becherer, Walter, to AGFA-Gevaert AG. Developing machine for radiation-sensitive material. 4,324,481, Cl. 354-324.000.
Beck, James A. Solar energy apparatus. 4,324,226, Cl. 126-429.000.
Beck, Lee R. Dental caries inhibiting product of immunized cow's milk having antibodies specific to killed *Streptococcus mutans* cells. 4,324,782, Cl. 424-87.000.
Becker, Kunibert: *See*—
Dreher, Hans-Joachim; and Becker, Kunibert, 4,324,510, Cl. 405-291.000.
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Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., 4,324,034, Cl. 29-410.000.
Beckman Instruments, Inc.: *See*—
Louderback, Allan L., 4,324,685, Cl. 252-408.000.
Beecham Group Limited: *See*—
Davis, Adrian F., 4,324,778, Cl. 424-10.000.
Beede, Charles H.; and Zirnite, Richard N., to Johnson & Johnson. Modifying agents for ion-leachable cement compositions. 4,324,591, Cl. 106-85.000.
Beker Industries, Inc.: *See*—
Sepehri-Nik, Hossein K., 4,324,577, Cl. 71-33.000.
Bell & Howell Company: *See*—
Johnson, Delmar R., 4,324,484, Cl. 355-5.000.
Bell, Ronald: *See*—
Kraemer, Edward J.; Therien, Robert D.; Rudy, Michael W.; Walsh, Frederick E.; Lee, Han J.; Bell, Ronald; and Horning, Thomas D., 4,324,474, Cl. 355-65.000.
Bell Telephone Laboratories, Incorporated: *See*—
Chang, Chuan C.; Cooper, James A., Jr.; Kahng, Dawon; and Murarka, Shyam P., 4,324,038, Cl. 29-571.000.
Coldren, Larry A., 4,325,038, Cl. 333-195.000.
Levy, Nicha, 4,324,575, Cl. 65-3.110.
Morehouse, James E.; and Pedersen, Richard A., 4,325,099, Cl. 361-93.000.
Pelletier, James A., 4,325,022, Cl. 324-52.000.
Slusky, Susan E. G.; and Trambarulo, Ralph F., 4,325,144, Cl. 455-324.000.
Van Dine, Gilbert A., 4,325,139, Cl. 375-28.000.
Belokin, Paul, Jr. Aluminum can with collapsible sidewall. 4,324,340, Cl. 220-1.00R.
Belthle, Heinz, to Fortuna-Werke Maschinenfabrik GmbH. Process for automatic feed of steady jaws. 4,324,073, Cl. 51-281.00R.
Bendefy nee Dobay, Erzsebet: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,324,743, Cl. 260-513.00N.
Bendix Corporation, The: *See*—
Hart, Russell F., 4,325,095, Cl. 361-23.000.
Sano, Frank M.; Sliwa, Robert A.; and Golden, Edward J., 4,324,168, Cl. 89-1.814.
Benkmann, Christian, to Linde Aktiengesellschaft. Removal of lubricant mists and lubricant vapors from a gaseous stream. 4,324,565, Cl. 55-23.000.
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, to Egyt Gyogyszervegyeszeti Gyar. Aminoisoquinoline derivatives. 4,324,894, Cl. 544-128.000.
Benko, Pal: *See*—
Messmer, Andras; Benko, Pal; Hajos, Gyorgy; Petocz, Lujza; Kosoczky, Ibolya; and Gorog, Peter, 4,324,786, Cl. 424-248.540.
Bensadoun, Michel. Electrode for a liquid rheostat, and a liquid rheostat including such an electrode. 4,325,049, Cl. 338-86.000.
Bensette, Joann: *See*—
Bensette, Leonard E.; and Bensette, Joann, 4,324,408, Cl. 280-7.130.
Bensette, Leonard E.; and Bensette, Joann, 4,324,413, Cl. 280-205.000.
Bensette, Leonard E.; and Bensette, Joann. Ice to roller skate converter. 4,324,408, Cl. 280-7.130.
Bensette, Leonard E.; and Bensette, Joann. Unicycle with water balance. 4,324,413, Cl. 280-205.000.
Bentley, Stanley L., to Ransburg Corporation. Method for controlling the flow of coating material. 4,324,812, Cl. 427-8.000.
Beran, Anthony V. Endotracheal tube. 4,324,235, Cl. 128-207.150.
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Sudan, Krishan K.; and Berchem, Antoine, 4,324,747, Cl. 264-13.000.
Berchtold, Max; and Jenny, Ernst, to BBC Brown, Bovari & Company, Limited. Apparatus for regulating a turbo-supercharger. 4,324,526, Cl. 415-48.000.
Berger, Michael, to Polaroid Corporation. Photographic processing composition containing polyol. 4,324,853, Cl. 430-245.000.
Bergmann, Erich; and Melet, Georges, to Battelle Memorial Institute. Process for depositing on substrates, by cathode sputtering, a self-lubricating coating of metal chalcogenides and the coating obtained by this process. 4,324,803, Cl. 428-472.000.
Bergmann, Horst: *See*—
Erdmannsdorfer, Hans; Bergmann, Horst; and Daudel, Helmut, 4,324,572, Cl. 55-385.00R.
Bernardi, Herbert: *See*—
Mitzel, Wilhelm; and Bernardi, Herbert, 4,324,394, Cl. 271-5.000.
Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., to Talon, Inc. Method and apparatus for gapping and reinforcing slide fastener stringers. 4,324,034, Cl. 29-410.000.
Bertus, Brent J.: *See*—
Roberts, John S.; Bertus, Brent J.; McKay, Dwight L.; and Mark, H. Wayne, 4,324,648, Cl. 208-114.000.
Bethea, James R., to Noble Manufacturing Company. Tiling arrangement and method. 4,324,605, Cl. 156-247.000.
Bettencourt, Pierre A.; and Cleveland, Charles H., to North Pacific Products, Inc. Toy aircraft. 4,324,064, Cl. 46-81.000.

Betz Laboratories, Inc.: *See—*
Geiger, Gary E.; and May, Roger C., 4,324,684, Cl. 252-389.00A.
Snyder, William R.; and Feuerstein, Diane, 4,324,664, Cl. 210-701.000.

Beukema, Duane M.; and Knoblauch, Jack R., to Steelcase Inc. Height adjustable chair base. 4,324,382, Cl. 248-406.000.

Bewley, David K.; and Finding, Kenneth, to National Research Development Corporation. Variable neutron collimator. 4,324,979, Cl. 250-505.000.

Beyer, Karl-Heinz: *See—*
Mueller, Hans; Wulz, Klaus; Beyer, Karl-Heinz; and Streit, Werner, 4,324,724, Cl. 260-239.00E.

Biaggi, Roberto; and Quintini, Massimo, to Sigma Italiana Prodotti Chimici S.p.A. Production of vinyl chloride polymer. 4,324,878, Cl. 526-200.000.

BICC Limited: *See—*
Allebone, Brian H., 4,325,039, Cl. 333-237.000.

Bickerstaff, Eric: *See—*
Cottingham, Richard L.; Thorpe, David J.; and Bickerstaff, Eric, 4,324,504, Cl. 404-74.000.

Bidwell, Robert E.: *See—*
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Billett, Ronald J.; and Viitanen, Veikko K., to FMC Corporation. Apparatus for freezing confection material. 4,324,108, Cl. 62-345.000.

Bilow, Norman, to United States of America, Air Force. Diethynylbenzene-ethylnylpyrene copolymers. 4,324,830, Cl. 428-257.000.

Biotrine Corporation: *See—*
Gazzara, Peter; Burke, John W., Jr.; and Edwards, Rodney, Jr., 4,324,127, Cl. 73-3.000.

Birbara, Philip J., to United Aircraft Corporation. Catalyst for hydrazine decomposition and the method of producing the catalyst. 4,324,819, Cl. 427-283.000.

Bishop-Hall, Inc.: *See—*
Bishop, Michael K., 4,325,057, Cl. 340-539.000.

Bishop, Michael K., to Bishop-Hall, Inc. School bus approach notification method and apparatus. 4,325,057, Cl. 340-539.000.

Blair, Howard D.; and Milberg, Morton E., to Ford Motor Company. Process for joining silicon nitride based ceramic bodies. 4,324,356, Cl. 228-193.000.

Blake, John H., to FMC Corporation. Process and system for drying coal in a fluidized bed by partial combustion. 4,324,544, Cl. 432-14.000.

Blaser, Lawrence M.: *See—*
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Blechschmitt, Kurt: *See—*
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Blinne, Gerd; Wurmb, Rolf; and Schmidt, Franz, to BASF Aktiengesellschaft. Preparation of amide-containing polyethers. 4,324,881, Cl. 528-173.000.

Bloch, Heinz, to BBC Brown, Boveri & Company Limited. Method and apparatus for regulating a steam turbine. 4,324,103, Cl. 60-663.000.

Bloch, Pierre G.: *See—*
Hirel, Jean C.; Goupy, Francois M.; Bloch, Pierre G.; and Degoulet, Patrice E., 4,324,663, Cl. 210-646.000.

Bloise, Rene: *See—*
Henchiri, Amar; Cecile, Jean-Luc; Baudet, Gerard; Barbery, Gilles; and Bloise, Rene, 4,324,653, Cl. 209-167.000.

Blose, Thomas L., to Hydril Company. Gaging system and method. 4,324,049, Cl. 33-199.00B.

Blount, David H. Process for the production of cellulose-silicate products. 4,324,864, Cl. 521-100.000.

Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates containing isocyanurate groups and the use thereof. 4,324,879, Cl. 528-45.000.

Boehmke, Gunther: *See—*
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Boeing Company, The: *See—*
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Miller, Glen E., 4,324,981, Cl. 250-551.000.

Boessler, Hanns: *See—*
Moroff, Helmut; Boessler, Hanns; Hauser, Hans; and Ladisich, Gerhard, 4,324,832, Cl. 428-289.000.

Bogoroditskaya, Irina V.: *See—*
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Boltze, Karl-Heinz; Dell, Hans-Dieter; and Jacobi, Haireddin, to Troponwerke GmbH & Co., KG. 2-Oxo-1-pyrrolidineacetic acid compounds and their medicinal use. 4,324,787, Cl. 424-250.000.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,324,093, Cl. 56-377.000.

Bommer, Raymond, to Cabinet Patco. Process for putting a lip on a thick-walled tube of flexible material, and apparatus for practicing same. 4,324,755, Cl. 264-312.000.

Bonicel, Jean P.; Cottevielle, Christian; Maucolot, Michel; and Prigent, Madeleine, to Societe Anonyme dite: Les Cables de Lyon. Fireproofed insulating material for an electric cable. 4,324,863, Cl. 521-85.000.

Boozalis, Ted S.: *See—*
Ivy, John B.; and Boozalis, Ted S., 4,324,757, Cl. 422-7.000.

Borgren, Peter M., to Hydrodynamic Energy Systems Corp. Portable hydrogenerating apparatus. 4,324,984, Cl. 290-54.000.

Borland, Walter G.; and Brehse, Robert F., to General Electric Company. Clamp assisted cycle control regulating system. 4,325,008, Cl. 315-241.00R.

Born, John W., to B. F. Goodrich Company, The. Sampling apparatus and process. 4,324,146, Cl. 73-863.120.

Borst, Roger L., to Phillips Petroleum Company. Uranium exploration. 4,324,555, Cl. 23-230.0EP.

Bosch-Siemens Hausgerage GmbH: *See—*
Steiner, Herbert; and Magg, Johann, 4,324,974, Cl. 219-553.000.

Bosch, Warren E.: *See—*
Kruger, Frederick W., Jr.; and Bosch, Warren E., 4,324,405, Cl. 273-238.000.

Bosher, John L. Solvent and heat recovery system for drying oven. 4,324,052, Cl. 34-27.000.

Boushek, Sidney J., Jr.; and Unterzuber, Travis B., to Deere & Company. Belt drive system with clutch. 4,324,552, Cl. 474-118.000.

Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., to Kennecott Corporation. Sand lump crushing device. 4,324,367, Cl. 241-60.000.

BP Chemicals Limited: *See—*
Johnstone, Alexander, 4,324,692, Cl. 252-429.00B.

Bradshaw, John; Oxford, Alexander W.; and Scopes, David I. C., to Glaxo Group Limited. Antihistaminic imidazoles. 4,324,792, Cl. 424-267.000.

Brady, Rupert J.: *See—*
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Branson International Plasma Corporation: *See—*
Vogel, Diane C.; Tang, Marian C.; and Reichelderfer, Richard F., 4,324,611, Cl. 156-643.000.

Brantley, Zachry G.; and Goode, Sidney H., to Hoechst Fibers Industries, Div. of American Hoechst Corp. Apparatus for handling textile filamentary material. 4,324,353, Cl. 226-118.000.

Brauer, Malcolm M. Synthesized target system. 4,324,977, Cl. 250-222.00R.

Braun, Beatrice: *See—*
Braun, Sam M.; and Braun, Beatrice, 4,324,250, Cl. 128-395.000.

Braun, Sam M.; and Braun, Beatrice. Body slenderizing method. 4,324,250, Cl. 128-395.000.

Brehse, Robert F.: *See—*
Borland, Walter G.; and Brehse, Robert F., 4,325,008, Cl. 315-241.00R.

Brennan, John J.; and Prewo, Karl M., to United Technologies Corporation. Continuous length silicon carbide fiber reinforced ceramic composites. 4,324,843, Cl. 428-697.000.

Brett, William C., to Trane Company, The. Control for vehicle temperature conditioning system. 4,324,286, Cl. 165-2.000.

Brima, Thomas S.: *See—*
Horvitz, David; and Brima, Thomas S., 4,324,909, Cl. 560-246.000.

Broadt, David R., to GTE Products Corporation. Photoflash array with selective pairing of lamps and switching of common circuit. 4,324,543, Cl. 431-359.000.

Broadt, David R.; and Audesse, Emergy G., to GTE Products Corporation. Multilamp photoflash unit with functional label. 4,325,104, Cl. 362-11.000.

Brockway Glass Company, Inc.: *See—*
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Brodeur, Lester R., to Sanders Associates, Inc. Method and apparatus for removing noise in a LORAN-C navigation receiver. 4,325,067, Cl. 343-103.000.

Brofft, Jerry: *See—*
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Bromley, Emily I.: *See—*
Meckel, Benjamin B.; and Bromley, Emily I., 4,324,631, Cl. 204-192.00M.

Broniarek, Czeslaw A.: *See—*
Taylor, Owen S.; and Broniarek, Czeslaw A., 4,324,997, Cl. 310-248.000.

Bronner, Jurgen, to Akzona Incorporated. Three-dimensional exchange element for liquid guidance in liquid-gas contact systems. 4,324,749, Cl. 261-112.000.

Brooks, Joseph J.: *See—*
Eisentraut, Kent J.; Ross, William D.; Hillan, William J.; Brooks, Joseph J.; and Duffy, Thomas G., 4,324,758, Cl. 422-61.000.

Brown, Arthur E., to Ingersoll-Rand Company. Rotary positive displacement machine with specific lobed rotor profiles. 4,324,538, Cl. 418-191.000.

Brown, Bruce J. Acoustic coupling system. 4,324,951, Cl. 179-1.00B.

Brown, Jack, to Singer Company, The. Auxiliary sewing machine motor braking. 4,324,191, Cl. 112-277.000.

Brown, Peter W.: *See—*
Harrison, Anthony W.; and Brown, Peter W., 4,324,319, Cl. 188-79.50K.

Brown & Williamson Tobacco Corporation: *See—*
Sexstone, John H.; Lewis, Tom; and Milliner, Ken, 4,324,540, Cl. 425-385.000.

Bruggi, Mario. Machine for roughing a peripheral vamp edge of a shoe. 4,324,118, Cl. 69-6.500.

Brun, Alain: *See—*
Koulbanis, Constantin; Millet, Catherine; Zabotto, Arlette; and Brun, Alain, 4,324,802, Cl. 424-364.000.

Bruno, Salvatore A., to Du Pont de Nemours, E. I., and Company. 1-(4-Alkylaminonaphthylazo)-4-nitrobenzene disperse dyes. 4,324,721, Cl. 260-196.000.

Buccicone, Velio S., to Bucciconi Engineering Co., Inc. Metal sheet handling machine. 4,324,522, Cl. 414-51.000.

Bucciconi Engineering Co., Inc.: *See*—
Buccicone, Velio S., 4,324,522, Cl. 414-51.000.

Buchfeld, Jurgen, to Goetze AG. Apparatus for orienting out-of-round workpieces. 4,325,125, Cl. 364-474.000.

Buck Chemisch-Technische Werke GmbH & Co.: *See*—
Prahauser, Georg; Schmidlin, Robert; and Trede, Wolfgang, 4,324,183, Cl. 102-334.000.

Buczynski, Neal J.; and Kern, Edward W., Jr., to TRW Inc. Snap-in bearing retainer and bearing. 4,324,444, Cl. 308-201.000.

Buehler, Ernest: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,324,773, Cl. 423-311.000.

Buethe, Ingolf: *See*—
Lechtken, Peter; Buethe, Ingolf; and Hesse, Anton, 4,324,744, Cl. 260-932.000.

Buffalo Color Corporation: *See*—
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., 4,324,926, Cl. 568-730.000.

Bugaut, Andree; and Junino, Alex, to L'Oreal. Hair dyeing compositions containing at least one 2,4-diamino-alkylbenzene as coupler. 4,324,553, Cl. 8-407.000.

Bulst, Wolf E.; and Eschler, Hans, to Siemens Aktiengesellschaft. Acoustic wave filter. 4,325,037, Cl. 333-194.000.

Burch, Hadley K., to B/K Patent Development, Inc. Circuit breaker. 4,325,046, Cl. 337-56.000.

Bureau de Recherches Geologiques et Minieres: *See*—
Henchiri, Amar; Cecile, Jean-Luc; Baudet, Gerard; Barbery, Gilles; and Bloise, Rene, 4,324,653, Cl. 209-167.000.

Burke, John W., Jr.: *See*—
Gazzara, Peter; Burke, John W., Jr.; and Edwards, Rodney, Jr., 4,324,127, Cl. 73-3.000.

Burkhardt, Friedrich; and Staiger, Hans. Machine including a clamping device for locating a workpiece in a given processing position. 4,324,027, Cl. 29-33.00P.

Burnham, Paul W., to Xerox Corporation. Development system. 4,324,490, Cl. 355-3.0DD.

Burroughs Corporation: *See*—
Durney, David J., 4,324,330, Cl. 206-328.000.
Quiogue, Virgilio, 4,325,111, Cl. 363-17.000.
Wiener, Daniel P., 4,325,056, Cl. 340-347.0DD.
Wolfe, John E., 4,324,999, Cl. 313-336.000.
Wolfe, John E.; and Swanson, Lynwood W., 4,325,000, Cl. 313-336.000.

Burston, Jonathan D.; and Henley, Robert G., to Barrett Burston (Australia) Limited. Dust retention device. 4,324,524, Cl. 414-291.000.

Buschor, Karl: *See*—
Moos, Kurt; and Buschor, Karl, 4,324,361, Cl. 239-3.000.

Buttaravoli, Philip M., to E-Med Corporation. Intravenous catheter and tubing securement and dressing device with a window over the puncture or wound site. 4,324,237, Cl. 128-214.00R.

Buzzi, Gunther; and Faisst, Magdalena, to Hans Grohe GmbH & Co. KG. Adjustable shower head. 4,324,364, Cl. 239-383.000.

Byers, Thomas L. Apparatus for modifying images on photographic film. 4,324,489, Cl. 355-84.000.

BYK Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung: *See*—
Eistetter, Klaus; and Rapp, Erich, 4,324,796, Cl. 424-278.000.

Byrt, Graham A.; and Graves, Bernard A., to Masson Scott Thrissell Engineering Limited. Stacking devices and platforms therefor. 4,324,397, Cl. 271-217.000.

C-D Marketing Ltd.: *See*—
Rauen, John T., Jr., 4,324,363, Cl. 239-284.00A.

C. van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,324,093, Cl. 56-377.000.

Cabinet Patco: *See*—
Bommer, Raymond, 4,324,755, Cl. 264-312.000.

Calcagno, Benedetto: *See*—
Ghirga, Marcello; Valtorta, Luigi; and Calcagno, Benedetto, 4,324,941, Cl. 585-466.000.

California Institute of Technology: *See*—
Beauchamp, Jesse L.; and George, Patricia M., 4,324,854, Cl. 430-296.000.

Calvin, Samuel E.: *See*—
Dykstra, Donald W.; and Calvin, Samuel E., 4,325,027, Cl. 324-329.000.

Campagnolo, Tullio. Freewheel device for bicycles. 4,324,323, Cl. 192-64.000.

Cann, Peter L., to Carrier Corporation. Series compressor refrigeration circuit with liquid quench and compressor by-pass. 4,324,105, Cl. 62-196.00A.

Cannaday, Sheridan S. Cushioning devices. 4,324,012, Cl. 5-432.000.

Canon Kabushiki Kaisha: *See*—
Morikawa, Teruo, 4,324,199, Cl. 118-658.000.
Ogawa, Yukio; and Hirohata, Michio, 4,324,471, Cl. 354-234.000.
Sato, Yasuhisa, 4,324,458, Cl. 350-454.000.
Sato, Yasushi; Saito, Seiji; and Ayata, Naoki, 4,325,086, Cl. 358-296.000.

Caputi, William J., Jr., to Eaton Corporation. Bistatic imaging radar processing for independent transmitter and receiver flightpaths. 4,325,065, Cl. 343-5.0CM.

Carl Freudenberg, Firma: *See*—
Schmitt, Wilhelm; and Taniguchi, Toyotake, 4,324,097, Cl. 60-293.000.

Carlson, David H. J., to UOP Inc. Catalytic composite and process for use. 4,324,650, Cl. 208-206.000.

Carlson, Robert C., to Minnesota Mining and Manufacturing Company. Controlling odor in photopolymerization. 4,324,679, Cl. 252-182.000.

Carlsson, Kurt I., to Jonsereds Aktiebolag. Motor test stand. 4,324,134, Cl. 73-117.100.

Carpenter, James H.: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,324,367, Cl. 241-60.000.

Carpenter, Rodney W., to Clayton & Lambert Manufacturing Co. Anti-pollution rotary-sweep grain drier. 4,324,053, Cl. 34-236.000.

Carr, John W. Disposable sitz bath. 4,324,008, Cl. 4-445.000.

Carrera, Angelo. Device for disposing a card roving in a fixed box. 4,324,021, Cl. 19-159.00R.

Carrier Corporation: *See*—
Cann, Peter L., 4,324,105, Cl. 62-196.00A.
Karns, Phil J., 4,324,288, Cl. 165-22.000.
Tulowiecki, David; and Lavassaur, Richard R., 4,324,358, Cl. 236-49.000.

Carson Products Company: *See*—
de la Guardia, Mario, 4,324,263, Cl. 132-7.000.

Carter, Barry E.: *See*—
Monte, Charles; and Carter, Barry E., 4,324,164, Cl. 84-1.040.

Cartwright, David, to Imperial Chemical Industries Limited. Process for preparing 2-chloro-5-trichloromethylpyridine. 4,324,627, Cl. 204-158.0HA.

Casio Computer Co., Ltd.: *See*—
Tamaki, Nobuo, 4,324,991, Cl. 307-443.000.

Castagnos, Leonce F., Jr.; Menzies, William R., III; and Pratt, Roy E., to Texaco Inc. Regeneration of cracking catalyst. 4,324,688, Cl. 252-417.000.

Caterpillar Tractor Co.: *See*—
Balzer, David J.; and Kessinger, Orville E., 4,324,303, Cl. 180-9.500.
Clarke, John M., 4,324,535, Cl. 418-51.000.
Dorris, Robert D., 4,324,155, Cl. 74-834.000.
Durham, Donald F., 4,324,114, Cl. 64-17.00A.
Fischer, Robert L., 4,324,435, Cl. 299-37.000.
Golan, Kenneth F.; Goloff, Charles N.; and Schmitt, James L., 4,324,274, Cl. 137-625.680.
Shank, Dane G., 4,324,536, Cl. 418-53.000.
Wulff, Bernard J., 4,324,412, Cl. 280-163.000.

Cavaler, Paul. Furniture spring assembly. 4,324,011, Cl. 5-248.000.

Cazals, Claude O. E.; and Ducoin, Jacques H. C., to Centre de Diffusion de la Methode Champenoise. Apparatus for treating wine by the champagne method. 4,324,172, Cl. 99-277.100.

Cecile, Jean-Luc: *See*—
Henchiri, Amar; Cecile, Jean-Luc; Baudet, Gerard; Barbery, Gilles; and Bloise, Rene, 4,324,653, Cl. 209-167.000.

Celtite, Inc.: *See*—
Patel, Natvarlal K.; and Plaisted, Anthony C., 4,324,592, Cl. 106-85.000.

Centre de Diffusion de la Methode Champenoise: *See*—
Cazals, Claude O. E.; and Ducoin, Jacques H. C., 4,324,172, Cl. 99-277.100.

Chafetz, Harry: *See*—
Levine, Stephen A.; Schlicht, Raymond C.; and Chafetz, Harry, 4,324,672, Cl. 252-49.700.

Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., to Allied Corporation. Hydrothermal process and apparatus for synthesizing crystalline powders. 4,324,773, Cl. 423-311.000.

Challet, Jacques, to Constructions Electriques. Electronic safety device for a fluid, particularly gaseous, fuel burner. 4,324,542, Cl. 431-78.000.

Champlin, Charles L., to Packaging Corporation of America. Carrier for a plurality of articles. 4,324,328, Cl. 206-194.000.

Chan, Yat S.: *See*—
Tantram, Anthony D. S.; and Chan, Yat S., 4,324,632, Cl. 204-195.00P.

Chang, Chuan C.; Cooper, James A., Jr.; Kahng, Dawon; and Murarka, Shyam P., to Bell Telephone Laboratories, Incorporated. Method of fabricating MOS field effect transistors. 4,324,038, Cl. 29-571.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Gustavson, Richard E.; Selvage, Craig C.; and Whitney, Daniel E., 4,324,032, Cl. 29-407.000.

Charlton, Webster T., to Stone and Webster Eng. Cor. Apparatus for lubricating electrical cable. 4,324,315, Cl. 184-15.00R.

Charnah, Richard M.: *See*—
Ballard, Denis G.; Charnah, Richard M.; Droughton, John F.; and Rideal, Graham R., 4,324,838, Cl. 428-402.000.

Charnley, John, to Charnley Surgical Inventions Limited. Blank for acetabular prosthesis. 4,324,006, Cl. 3-1.912.

Charnley Surgical Inventions Limited: *See*—
Charnley, John, 4,324,006, Cl. 3-1.912.

Chasteen, Jack W., to University of Dayton. Method for cleaning metal parts. 4,324,594, Cl. 134-2.000.

Chattem, Inc.: *See*—
Pratt, Charles E., 4,324,670, Cl. 252-37.700.

Chausse, Leon C., to Inland Manufacturing Company. Heavy duty radiator bench and hoist. 4,324,393, Cl. 269-46.000.

Chemetron Railway Products, Inc.: *See*—
Frost, Ralph S., 4,324,048, Cl. 33-180.00R.
Chemische Werke Huels, AG: *See*—
Hahn, Karl; and Kampf, Wolfgang, 4,324,939, Cl. 585-438.000.
Chen, Mabel M.: *See*—
Sandler, Stanley R.; and Chen, Mabel M., 4,324,910, Cl. 564-60.000.
Chermenskay, Taisia S.: *See*—
Redikultsev, Jury V.; Litvinenko, Leonid A.; Petrikevich, Svetlana B.; Chermenskay, Taisia S.; Vershkov, David S.; Nesterov, Boris F.; and Bogoroditskaya, Irina V., 4,324,762, Cl. 422-106.000.
Chevron Research Company: *See*—
MacKinnon, Hugh S., 4,324,674, Cl. 252-78.500.
Chiappetti, Arthur B., to Kleinke, Bernard L., a part interest. Animal feeding apparatus. 4,324,203, Cl. 119-51.110.
Chicha, George. Wall construction. 4,324,081, Cl. 52-432.000.
Chicoye, Etzer: *See*—
Goldstein, Henry; Fly, Walter; Ting, Patrick; and Chicoye, Etzer, 4,324,810, Cl. 426-600.000.
Chik, Kiu-Chi D.: *See*—
Dyment, John C.; Look, Christopher M.; and Chik, Kiu-Chi D., 4,325,034, Cl. 372-50.000.
Chilenskas, Albert A.: *See*—
Kaun, Thomas D.; and Chilenskas, Albert A., 4,324,846, Cl. 429-112.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,324,743, Cl. 260-513.00N.
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth nee Zalantai, Livia, 4,324,903, Cl. 560-82.000.
Chisso Corporation: *See*—
Harada, Masato; Yamada, Sadahiko; Suzuki, Atsushi; and Masuda, Jun, 4,324,875, Cl. 526-115.000.
Chouteau, Henri; and Lagros, Gilbert. Method and apparatus for cleaning conveyor belts by means of a vibrating cable or group of cables. 4,324,327, Cl. 198-497.000.
Christian, John B.; and Tamborski, Christ, to United States of America, Air Force. Grease compositions based on fluorinated polysiloxanes. 4,324,671, Cl. 252-49.600.
Christian, John B.; and Tamborski, Christ, to United States of America, Air Force. Grease compositions based on polyfluoroalkylethers. 4,324,673, Cl. 252-51.50R.
Ciaccia, Vittorio: *See*—
Parrini, Paolo; Ciaccia, Vittorio; Corrieri, Guglielmo; and Righi, Gian P., 4,324,831, Cl. 428-288.000.
Ciba Geigy AG: *See*—
Tschopp, Paul, 4,324,898, Cl. 548-184.000.
Ciba-Geigy Corporation: *See*—
Kosche, Horst, 4,324,420, Cl. 282-27.500.
Vogel, Christian; and Aebi, Rudolf, 4,324,580, Cl. 71-118.000.
Zondler, Helmut; and Moser, Roland, 4,324,739, Cl. 260-465.400.
Cicerone, Aurelio, to Officine Savio S.p.A. Semiautomatic device for doffing spools from a spindle bench. 4,324,094, Cl. 57-267.000.
Cilderman, Janis J.: *See*—
Sun, Lu; and Cilderman, Janis J., 4,324,360, Cl. 238-349.000.
Ciongwa, Joachim: *See*—
Kruger, Roland; Ciongwa, Joachim; Smusch, Gunther; and Ehrlinger, Klaus, 4,324,264, Cl. 134-68.000.
City Technology Limited: *See*—
Tantram, Anthony D. S.; and Chan, Yat S., 4,324,632, Cl. 204-195.00P.
Clark Equipment Company: *See*—
Gaylord, Richard P.; and Miller, Wendell E., 4,324,171, Cl. 92-169.000.
Clark, O. Melville, to General Semiconductor Industries, Inc. Four terminal pulse suppressor. 4,325,097, Cl. 361-56.000.
Clarke, John M., to Caterpillar Tractor Co. Slant axis rotary piston mechanism with fixed sinuous partition in grooved rotor. 4,324,535, Cl. 418-51.000.
Clayton & Lambert Manufacturing Co.: *See*—
Carpenter, Rodney W., 4,324,053, Cl. 34-236.000.
Clayton Manufacturing Company: *See*—
Stevenson, David J., 4,324,133, Cl. 73-117.000.
Clement, Donald R.; and Nikirk, Roger G., to Motorola, Inc. Method for the controlled melting of semiconductor bodies. 4,324,610, Cl. 156-602.000.
Clendenen, Dorothy. Aid for starting motor vehicles. 4,324,308, Cl. 180-315.000.
Cleveland, Charles H.: *See*—
Bettencourt, Pierre A.; and Cleveland, Charles H., 4,324,064, Cl. 46-81.000.
Coates, Clarence A., Jr.: *See*—
Weaver, Max A.; and Coates, Clarence A., Jr., 4,324,719, Cl. 260-152.000.
Cocron, Istvan: *See*—
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, 4,324,463, Cl. 354-25.000.
Cohen, Leonard: *See*—
Seaton, John C.; and Cohen, Leonard, 4,325,078, Cl. 358-117.000.
Cojean, Maurice; and Colin, Jean-Paul, to Ateliers et Chantiers de Bretagne ACB. Device for removing and depositing loads between two supports in repeated relative vertical movement. 4,324,385, Cl. 254-270.000.
Colamonico, Armando, to Societa Italiana Telecomunicazioni Siemens S.p.A. Frequency discriminator for signal receiver of telecommunication system. 4,325,030, Cl. 328-140.000.
Colardelle, Joel S.; Girard, Pierre; and Pillou, Jean-Pierre M., to International Standard Electric Corporation. Analog-to-digital converter. 4,325,055, Cl. 340-347.0AD.
Coldren, Larry A., to Bell Telephone Laboratories, Incorporated. SAW Resonator filters with improved temperature stability. 4,325,038, Cl. 333-195.000.
Colin, Jean-Paul: *See*—
Cojean, Maurice; and Colin, Jean-Paul, 4,324,385, Cl. 254-270.000.
Colley, Stephen R.; Cox, George W.; Rattner, Justin R.; and Swanson, Roger C., to Intel Corporation. Data processing system. 4,325,120, Cl. 364-200.000.
Collombin, Andre M.: *See*—
Curetti, Ennio G.; and Collombin, Andre M., 4,324,541, Cl. 425-562.000.
Colombo, Roberto, to Lavorazione Materie Plastiche L.M.P-S.p.A. Mixer-cooler device for the extrusion of thermoplastic foams. 4,324,493, Cl. 366-79.000.
Coloroll Limited: *See*—
Griffin, Gerald J. L., 4,324,709, Cl. 523-210.000.
Combustion Engineering, Inc.: *See*—
Rehm, Stephen J.; and Lee, Young R., 4,324,734, Cl. 260-403.000.
Cominco Ltd.: *See*—
Kerby, Robert C., 4,324,621, Cl. 204-1.00T.
Communications Satellite Corp.: *See*—
Stockel, Joseph F., 4,324,845, Cl. 429-101.000.
Compagnie Industrielle des Telecommunications: *See*—
Le Brozec, Pierre; Ferret, Francois; and Doussoux, Pierre, 4,325,053, Cl. 340-347.0DD.
Compass Electronics: *See*—
Dykstra, Donald W.; and Calvin, Samuel E., 4,325,027, Cl. 324-329.000.
Conn, James F.; and Jessen, Leofwin A., to Monsanto Company. Process for producing hydroxyapatite. 4,324,772, Cl. 423-309.000.
Connor, Thomas J.: *See*—
Robertson, Robert F.; Connor, Thomas J.; and Rodkey, F. Lee, 4,324,556, Cl. 23-230.00B.
Conoco Inc.: *See*—
Fonseca, Anthony G., 4,324,560, Cl. 44-1.0SR.
Conradt, James C. Apparatus for the preparation of shish kabobs. 4,324,174, Cl. 99-421.00H.
Constructions Electriques: *See*—
Challet, Jacques, 4,324,542, Cl. 431-78.000.
Conti, Joseph A.: *See*—
Albright, David B.; and Conti, Joseph A., 4,324,396, Cl. 271-125.000.
Continental Group, Inc., The: *See*—
Hewitt, Norman S., 4,324,190, Cl. 108-51.100.
Moller, Jens L., 4,324,343, Cl. 220-270.000.
Murkowski, Rita J., 4,324,357, Cl. 229-37.00E.
Convers, Alaio: *See*—
Torck, Bernard; Convers, Alaio; Duee, Didier; and Mikitenko, Paul, 4,324,924, Cl. 568-697.000.
Conway, Tim D.; and Paddock, Paul F., to Sunkist Growers, Inc. Method and apparatus for measuring the surface size of an article. 4,324,335, Cl. 209-586.000.
Cooper, Frank W., Jr.; and Golick, Leonard R., to Westinghouse Electric Corp. Plural coil eddy current mapping probe. 4,325,026, Cl. 324-232.000.
Cooper, James A., Jr.: *See*—
Chang, Chuan C.; Cooper, James A., Jr.; Kahng, Dawon; and Murarka, Shyam P., 4,324,038, Cl. 29-571.000.
Cooper, Julius, to Ideal Toy Corporation. Balance operated game. 4,324,065, Cl. 46-120.000.
Corbett, Marshall J.; and London, Arnold. Thermal detection system. 4,325,145, Cl. 455-600.000.
Corcoran, Richard A.; Keenan, William A.; Michaelides, Demetrios; and Yun, Bob H., to International Business Machines Corporation. Automated channel doping measuring circuit. 4,325,025, Cl. 324-158.00R.
Cordes, William F., III; Goodman, Donald; and Miller, Robert S., to Tenneco Chemicals, Inc. Production of vinyl halide polymers with dialkyl, hydroxy phenyl alkanoic ester of polyhydric alcohols. 4,324,874, Cl. 526-84.000.
Cordier, Georges, to Rhone-Poulenc Agrochimie. Process for preparation of anilines substituted by chlorine in the meta-position. 4,324,914, Cl. 564-412.000.
Corradi, Gabriel, to Sarl dite: Astin-France-Assistance Technique Industrielle. Humidifier arrangement for a travelling hydrophilic web. 4,324,609, Cl. 156-470.000.
Corrieri, Guglielmo: *See*—
Parrini, Paolo; Ciaccia, Vittorio; Corrieri, Guglielmo; and Righi, Gian P., 4,324,831, Cl. 428-288.000.
Cosyns, Jean; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, to Institut Francais du Petrole. Process for upgrading C_4 olefinic cuts. 4,324,938, Cl. 585-332.000.
Cosyns, Jean: *See*—
Le Page, Jean-Francois; Cosyns, Jean; Miquel, Jean; and Juguin, Bernard, 4,324,646, Cl. 208-71.000.
Cottevielle, Christian: *See*—
Bonicel, Jean P.; Cottevielle, Christian; Maucolot, Michel; and Prigent, Madeleine, 4,324,863, Cl. 521-85.000.
Cottingham, Richard L.; Thorpe, David J.; and Bickerstaff, Eric, to Thormack Sealants Limited. Method of sealing bridge deck joints. 4,324,504, Cl. 404-74.000.

Cotton, John F.: *See*—
Ristuccia, Donald J.; and Cotton, John F., 4,324,961, Cl. 200-150.00R.
Coughlan, Edward H., to Polaroid Corporation. SX-70 Film pack with battery hold down structure. 4,324,473, Cl. 354-276.000.
Cowdery, James R.: *See*—
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,324,326, Cl. 198-461.000.
Cox, George W.: *See*—
Colley, Stephen R.; Cox, George W.; Rattner, Justin R.; and Swanson, Roger C., 4,325,120, Cl. 364-200.000.
Cox, Howard E.; and Rush, Dale L. Temperature control system. 4,324,224, Cl. 126-422.000.
Craft, William K., to Batesville Casket Company, Inc. Cremation urn with readily accessible memorabilia compartment. 4,324,026, Cl. 27-1.000.
Crandall, Janice L.; and Crandall, Richard W. Hosiery repair kit. 4,324,603, Cl. 156-584.000.
Crandall, Richard W.: *See*—
Crandall, Janice L.; and Crandall, Richard W., 4,324,603, Cl. 156-584.000.
Craven, Mark. Router guide apparatus for cutting printing plates. 4,324,514, Cl. 409-179.000.
Crawford, Russell C., III. Variable cross section V-belt. 4,324,147, Cl. 74-37.000.
Creek, Ronald B.: *See*—
Sowers, Michael G.; Creek, Ronald B.; and DeFur, Donovan D., 4,324,617, Cl. 376-405.000.
Crescent Engineering Company: *See*—
Hack, Albert G., 4,324,652, Cl. 209-3.000.
Crompton Parkinson Limited: *See*—
Stephenson, Edward G.; and Taylor, Tom, 4,324,754, Cl. 264-268.000.
Cross, Marvin G., to Abbott Laboratories. Feminine syringe. 4,324,242, Cl. 128-232.000.
Cumbo, Charles C., to Du Pont de Nemours, E. I., and Company. Process for preparing alkanediols by electrochemical coupling of halohydrins. 4,324,625, Cl. 204-72.000.
Cummins Engine Company, Inc.: *See*—
Kasting, Edward W.; Glasson, Richard E.; and Primus, Roy J., 4,324,213, Cl. 123-196.00A.
Cunningham, Frank D.; Witt, Michael A.; and Hill, Robert M., to Perry Oceanographics, Inc. Tender for submarine cable. 4,324,195, Cl. 114-312.000.
Curetti, Ennio G.; and Collombin, Andre M., to Motosacoche S.A. Apparatus for manufacturing an object in plastics material. 4,324,541, Cl. 425-562.000.
Cutler, Christopher R., to Exxon Production Research Company. Method for snubbing or restraining a cable. 4,324,193, Cl. 114-199.000.
Cyborex Laboratories, Inc.: *See*—
Sullivan, C. Gardner, II; and Hedges, Walter P., 4,324,987, Cl. 307-35.000.
Dagiel, Richard T., to Aetna Bearing Company. Sealed thrust bearing assembly. 4,324,443, Cl. 308-187.100.
Dahlhausen, Gebhard; Dibbern, Hans-Werner; Fulberth; and Ross, Gerhard, to Hoechst Aktiengesellschaft. Method for treating hypertonia with N-(2-furfuryl)-4-chloro-5-sulfamoyl-anthranilic acid and preparations thereof. 4,324,779, Cl. 424-20.000.
Dahm, Manfred; Jabs, Gert; and Wegner, Christian, to Bayer Aktiengesellschaft. Process for making carbonless copying paper. 4,324,817, Cl. 427-150.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Nagano, Katsusuke, 4,324,179, Cl. 101-170.000.
Daimler-Benz Aktiengesellschaft: *See*—
Erdmannsdorfer, Hans; Bergmann, Horst; and Daudel, Helmut, 4,324,572, Cl. 55-385.00R.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Nishihama, Takamichi, 4,324,487, Cl. 355-73.000.
Nomura, Norimasa; and Yoshida, Atsushi, 4,324,480, Cl. 354-320.000.
Daley, Michael L. Method and apparatus for testing flicker fusion frequency. 4,324,460, Cl. 351-36.000.
Dalisa, Andrew L., to U.S. Philips Corporation. Electrophoretic projection display systems. 4,324,456, Cl. 350-362.000.
Damico, Frank M.: *See*—
Houlberg, Don M.; Anderson, Larry D.; and Damico, Frank M., 4,324,010, Cl. 5-68.000.
Damon Corporation: *See*—
Lim, Franklin; and Moss, Richard D., 4,324,683, Cl. 252-316.000.
Danckert, Hermann; and Leptien, Helmut, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with a sound insulating casing. 4,324,208, Cl. 123-195.00C.
Danfoss A/S: *See*—
Molgaard, Aage, 4,324,196, Cl. 116-277.000.
Dankese, Joseph P. Ion exchange membranes. 4,324,636, Cl. 204-296.000.
Danly Machine Corporation: *See*—
Heiberger, Francis E., 4,325,015, Cl. 318-625.000.
Daudel, Helmut: *See*—
Erdmannsdorfer, Hans; Bergmann, Horst; and Daudel, Helmut, 4,324,572, Cl. 55-385.00R.
David, Lawrence D.: *See*—
West, Robert C.; and David, Lawrence D., 4,324,901, Cl. 556-430.000.
Davis, Adrian F., to Beecham Group Limited. Pharmaceutical composition containing parcetamol. 4,324,778, Cl. 424-10.000.
Davis, Bayard C.; and Heyden, Donald H., to Alarma Systems Incorporated. Method of and apparatus and system for determining temperature conditions. 4,324,138, Cl. 73-341.000.
Davis, James A.; and Koch, Robert C., to Firestone Tire & Rubber Company, The. Naturally occurring thermoplastic resins as a substitute for various petroleum-derived materials in rubber stocks. 4,324,710, Cl. 524-76.000.
Davis, Loren L., to Kraft, Inc. Preparation of a soft cream cheese product. 4,324,804, Cl. 426-36.000.
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., to Zirconal Processes Limited. Method for reducing the thermal inertia of furnace or oven walls. 4,324,602, Cl. 156-71.000.
Davis, Steven S., to Envirotech Corporation. Twin belt vacuum washer. 4,324,116, Cl. 68-158.000.
Dawdy, Jack A.: *See*—
Rutkowski, Edward J.; Mapes, Carl R.; Wing, Steven D.; and Dawdy, Jack A., 4,324,082, Cl. 52-481.000.
Dawson, Charles W.: *See*—
Parmet, Arthur A.; and Dawson, Charles W., 4,325,117, Cl. 364-200.000.
Daystrom Limited: *See*—
Riech, Volker; Saupe, Wolfgang; and Sorgenicht, Dietrich, 4,324,126, Cl. 73-1.00J.
DBS, Inc.: *See*—
Maul, John A., Sr., 4,324,181, Cl. 101-269.000.
de la Guardia, Mario, to Carson Products Company. Hair straightening process and hair curling process and compositions therefor. 4,324,263, Cl. 132-7.000.
Dean, John J.; and Helzig, Lloyd M., to NIPAC, Ltd. Combustible fuel pellets formed from botanical material. 4,324,561, Cl. 44-10.00E.
de Araujo Pinheiro, Edwin J.: *See*—
Kranz, Roger H.; de Araujo Pinheiro, Edwin J.; and Tuttle, James A., 4,325,116, Cl. 364-200.000.
Deb, Satyendra K., to American Cyanamid Company. Multilayered electroplatographic element comprising ion conductive and electrochromic layers. 4,324,622, Cl. 430-63.000.
Deere & Company: *See*—
Boushek, Sidney J., Jr.; and Unterzuber, Travis B., 4,324,552, Cl. 474-118.000.
DeFur, Donovan D.: *See*—
Sowers, Michael G.; Creek, Ronald B.; and DeFur, Donovan D., 4,324,617, Cl. 376-405.000.
Degoulet, Patrice E.: *See*—
Hirel, Jean C.; Goupy, Francois M.; Bloch, Pierre G.; and Degoulet, Patrice E., 4,324,663, Cl. 210-646.000.
Delguidice, Henry L.: *See*—
Weisenburger, Lawrence P.; and Delguidice, Henry L., 4,324,450, Cl. 339-97.00R.
Dell, Hans-Dieter: *See*—
Boltze, Karl-Heinz; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,324,787, Cl. 424-250.000.
Dembicki, Michael T.; and Poad, William J., to Brockway Glass Company, Inc. Preparation of glass container for thermoplastic closure. 4,324,601, Cl. 156-69.000.
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., to Buffalo Color Corporation. Process for the purification of 4,4' dihydroxydiphenyl. 4,324,926, Cl. 568-730.000.
Denison, Early B., to Shell Oil Company. Steering drill string. 4,324,297, Cl. 175-45.000.
Denkinger, Charles. Separating wall. 4,324,825, Cl. 428-99.000.
Design + Process Engineering Inc.: *See*—
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,324,326, Cl. 198-461.000.
Dessau, Ralph M., to Mobil Oil Corporation. Shape selective acid catalyzed reactions of olefins over crystalline zeolites. 4,324,940, Cl. 585-466.000.
DeVita, Joseph; and Pirzadeh, Brian, to Western Digital Corporation. Instruction fetch circuitry for computers. 4,325,118, Cl. 364-200.000.
Devlin, Thomas A., to Vultron, Incorporated. Monitor for bus destination signs. 4,325,062, Cl. 340-717.000.
Dewoolfson, Bruce H. Apparatus for collection of metallic containers and method therefor. 4,324,325, Cl. 194-4.00C.
Dey, Ervin J., to SPS Technologies, Inc. Panel fastener assembly with retainer ring. 4,324,517, Cl. 411-353.000.
Dhein, Rolf; Reuter, Knud; Rudolph, Hans; and Pfitzner, Jorg, to Bayer Aktiengesellschaft. β-Hydroxybutyric acid polyesters, a process for their production and their use as starting materials for lacquers. 4,324,880, Cl. 528-80.000.
Dhein, Rolf: *See*—
Eimers, Erich; and Dhein, Rolf, 4,324,934, Cl. 585-21.000.
Dian, Walter, to Walter Dian, Inc. Golf putter. 4,324,404, Cl. 273-169.000.
Diaz, Juan A. Apparatus for removing a grinding wheel. 4,324,030, Cl. 29-240.000.
Dibbern, Hans-Werner: *See*—
Dahlhausen, Gebhard; Dibbern, Hans-Werner; Fulberth; and Ross, Gerhard, 4,324,779, Cl. 424-20.000.
Diemolding Corporation: *See*—
Puderbaugh, George, 4,324,260, Cl. 128-728.000.
Digital Communications Corporation: *See*—
Gooch, Robert P., 4,325,085, Cl. 358-261.000.

Dil, Jan G.; and Heemskerk, Jacobus P. J., to U.S. Philips Corporation. Optical record carrier and apparatus for reading it. 4,325,135, Cl. 369-110.000.

Diller, Isaac M. Method for the activation of a composition for fused bath electrolysis. 4,324,624, Cl. 204-67.000.

Dimas, Herman, Jr.; and Dimas, Janice E. Infant carrier particularly for grocery store shopping carts. 4,324,430, Cl. 297-250.000.

Dimas, Janice E.: *See*—
Dimas, Herman, Jr.; and Dimas, Janice E., 4,324,430, Cl. 297-250.000.

Dines, Martin B., to Occidental Research Corporation. Separation process utilizing microcapsules. 4,324,767, Cl. 423-3.000.

Disko, Harry: *See*—
Rosenwinkel, Donald A.; and Disko, Harry, 4,324,063, Cl. 46-44.000.

Dixon, Richard D., to Huck Manufacturing Company. Dish compensating flush head fastener. 4,324,518, Cl. 411-361.000.

Dr.-Ing. Reiner Foerst GmbH: *See*—
Foerst, Reiner, 4,324,166, Cl. 84-454.000.

Dollard, Richard M.: *See*—
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., 4,324,926, Cl. 568-730.000.

Donahue, Donald T.: *See*—
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., 4,324,926, Cl. 568-730.000.

Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, to I.S.F. S.p.A. Alkoxyalkylidenhydrazinopridazines and process for their preparation. 4,324,788, Cl. 424-250.000.

Dorn, Clifford R.: *See*—
Miyano, Masateru; and Dorn, Clifford R., 4,324,902, Cl. 560-53.000.

Dorris, Robert D., to Caterpillar Tractor Co. Mounting assembly for a control actuator. 4,324,155, Cl. 74-834.000.

Doussoux, Pierre: *See*—
Le Brozec, Pierre; Ferret, Francois; and Doussoux, Pierre, 4,325,053, Cl. 340-347.0DD.

Dow Chemical Company, The: *See*—
Gibbs, Dale S.; Sinacola, James F.; and Ranck, Dan E., 4,324,714, Cl. 524-113.000.
Gilbert, Herman S., 4,324,676, Cl. 252-79.000.
Hayes, Ronald J., 4,324,829, Cl. 428-215.000.
Holmsen, Theodore W.; Barrons, Keith C.; and Smith, Leonard L., Jr., 4,324,581, Cl. 71-126.000.
Ivy, John B.; and Boozalis, Ted S., 4,324,757, Cl. 422-7.000.
Malhotra, Sudarshan K., 4,324,896, Cl. 546-301.000.
Pryor, Alvetta; and Ishibe, Nobuyuki, 4,324,928, Cl. 570-118.000.
Smith, William E., 4,324,922, Cl. 568-437.000.

Dow Corning Corporation: *See*—
Kasprzak, Kenneth A., 4,324,595, Cl. 134-38.000.
Swihart, Terence J., 4,324,720, Cl. 260-185.000.

Draftex Development, A.G.: *See*—
Ginster, Helmut, 4,324,826, Cl. 428-122.000.

Drake, Charles A.; and Turk, Stanley D., to Phillips Petroleum Company. Dinitriles and their preparation. 4,324,738, Cl. 260-465.00H.

Dreher, Hans-Joachim; and Becker, Kunibert, to Gewerkschaft Eisenhutte Westfalia. Apparatus for supporting a mine roof support assembly. 4,324,510, Cl. 405-291.000.

Drenckhan, Jurgen; and Trinks, Roland. Method of and arrangement for performing optical interference measurements. 4,324,492, Cl. 356-345.000.

Driemeyer, Manfred, to Mannesmann DeMag AG. Apparatus for manufacturing steel from iron ore dust by direct reduction. 4,324,390, Cl. 266-155.000.

Driker, Benjamin. Method and apparatus for measuring the melting temperature of greasy products. 4,324,130, Cl. 73-17.00R.

Droughton, John F.: *See*—
Ballard, Denis G.; Charnah, Richard M.; Droughton, John F.; and Rideal, Graham R., 4,324,838, Cl. 428-402.000.

Dubovi, Edward J.: *See*—
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,324,794, Cl. 424-273.00B.

Ducoin, Jacques H. C.: *See*—
Cazals, Claude O. E.; and Ducoin, Jacques H. C., 4,324,172, Cl. 99-277.100.

Dudley, James M.: *See*—
Sain, Bernard S.; and Dudley, James M., 4,324,516, Cl. 411-5.000.

Duee, Didier: *See*—
Torck, Bernard; Convers, Alaio; Duee, Didier; and Mikitenko, Paul, 4,324,924, Cl. 568-697.000.

Duffy, Thomas G.: *See*—
Eisentraut, Kent J.; Ross, William D.; Hillan, William J.; Brooks, Joseph J.; and Duffy, Thomas G., 4,324,758, Cl. 422-61.000.

Dugger, Doyle, to Bandag Incorporated. Hose building machine. 4,324,607, Cl. 156-350.000.

Dulen, Edwina K., to Oak Industries Inc. Membrane switch having a puff ink spacer. 4,324,962, Cl. 200-159.00B.

Dumbeck, Robert F. Solar energy collector system. 4,324,947, Cl. 136-248.000.

Dumont, Claude: *See*—
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,324,790, Cl. 424-263.000.

Dunham, Richard M., to GCA Corporation. Automatic wafer alignment system. 4,325,077, Cl. 358-107.000.

Dunlop Limited: *See*—
Keen, Christopher V., 4,324,835, Cl. 521-54.000.

Dunmire, Howard L.: *See*—
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,324,104, Cl. 62-77.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bruno, Salvatore A., 4,324,721, Cl. 260-196.000.
Cumbo, Charles C., 4,324,625, Cl. 204-72.000.
Emerick, Dennis P., 4,324,715, Cl. 523-400.000.
Fagan, Joseph P., 4,324,574, Cl. 55-487.000.
Lulay, Arthur; and Lynch, Charles E., 4,324,095, Cl. 57-327.000.
McCormick, Robert M., 4,324,176, Cl. 100-3.000.
Withers, Michael S., 4,324,606, Cl. 156-272.200.

Duracell International Inc.: *See*—
Bartunek, William; Kaye, Gordon E.; and Mallory, Henry R., 4,325,106, Cl. 362-157.000.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process with feed pretreatment utilizing a beneficially reactive gas. 4,324,637, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process for stabilizing volatile hydrocarbons. 4,324,638, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process with feed pretreatment. 4,324,639, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process. 4,324,640, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process utilizing a beneficially reactive gas. 4,324,641, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process for producing condensed stabilized hydrocarbons utilizing a beneficially reactive gas. 4,324,642, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process for producing condensed stabilized hydrocarbons. 4,324,643, Cl. 208-8.0LE.

Durai-Swamy, Kandaswamy, to Occidental Research Corporation. Pyrolysis process for stabilizing volatile hydrocarbons utilizing a beneficially reactive gas. 4,324,644, Cl. 208-8.0LE.

Durbin, Howard M., to James B. Lansing Sound, Inc. Diaphragm suspension construction. 4,324,312, Cl. 181-171.000.

Durette, Philippe L., to Merck & Co., Inc. 3-Amino-4-C-carboxy-2,3,4,6-tetradeoxy-D-arabino-hexose trimethylene dithioacetal. 4,324,900, Cl. 549-11.000.

Durham, Donald F., to Caterpillar Tractor Co. Moveable joint seal. 4,324,114, Cl. 64-17.00A.

Durkin, Joseph A.: *See*—
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., 4,324,698, Cl. 252-455.00Z.

Durney, David J., to Burroughs Corporation. Card cage for electronic circuit cards. 4,324,330, Cl. 206-328.000.

Dust, James A., to Telex Communications, Inc. Mechanism for retracting the pressure rollers of a tape transport when the power is off. 4,324,355, Cl. 226-190.000.

DuTone Corporation: *See*—
Hunt, John E., 4,324,666, Cl. 210-722.000.

Dykstra, Donald W.; and Calvin, Samuel E., to Compass Electronics. Metal detector for locating objects with full sensitivity in the presence of distributed mineral material. 4,325,027, Cl. 324-329.000.

Dyment, John C.; Look, Christopher M.; and Chik, Kiu-Chi D., to Northern Telecom Limited. Semiconductor lasers with integrally formed light emitting diodes. 4,325,034, Cl. 372-50.000.

Dynamit Noble Aktiengesellschaft: *See*—
Josten, Walter; and Vahlensieck, Hans-Joachim, 4,324,736, Cl. 260-429.00R.

E-Med Corporation: *See*—
Buttaravoli, Philip M., 4,324,237, Cl. 128-214.00R.

Eagle-Picher Industries, Inc.: *See*—
Lister, Roy D., 4,324,438, Cl. 308-3.500.

Eastman Kodak Company: *See*—
Adin, Anthony; and Fleming, James C., 4,324,852, Cl. 430-178.000.
Frishberg, Mark D., 4,324,899, Cl. 548-190.000.
Harvey, Donald M., 4,324,469, Cl. 354-214.000.
Kerr, Donald L.; and Russo, Gary M., 4,324,849, Cl. 430-3.000.
Landis, Newton C. M.; and Zollo, Corrado, 4,324,816, Cl. 427-128.000.
Seely, Neil G., 4,324,476, Cl. 354-288.000.
Weaver, Max A.; and Coates, Clarence A., Jr., 4,324,719, Cl. 260-152.000.

Eastman Technology, Inc.: *See*—
Wright, Charles E., 4,325,088, Cl. 360-14.000.

Eaton Corporation: *See*—
Caputi, William J., Jr., 4,325,065, Cl. 343-5.0CM.
Olson, Jerry A., 4,324,143, Cl. 73-861.620.

Ebara Corp: *See*—
Aoki, Shinji; Ishikawa, Ryuichi; and Sawada, Yasuhiro, 4,324,759, Cl. 422-62.000.

Ebara Corporation: *See*—
Ito, Kanichi; Hirayama, Yoshio; Ishii, Yoshiaki; and Ando, Naoyoshi, 4,324,620, Cl. 202-89.000.

Ebato, Noboru; Kahara, Toshiki; and Tamura, Kohki, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Structure of positive plate of enclosed type battery. 4,324,828, Cl. 429-209.000.

Ebnet, Friedrich: *See*—
Edenharter, Georg; and Ebnet, Friedrich, 4,324,964, Cl. 200-331.000.

Edenharter, Georg; and Ebnet, Friedrich, to Siemens Aktiengesellschaft. Device for extending plunger drives. 4,324,964, Cl. 200-331.000.

Edmonds, James T., Jr.; and Scoggins, Lacey E., to Phillips Petroleum Company. Arylene sulfide polymer prepared from aminoalkanoate. 4,324,886, Cl. 528-387.000.

Edward L. Bateman Limited: *See*—
Rabinovitch, Yosef K., 4,324,302, Cl. 180-8.00C.

Edwards, Rodney, Jr.: *See*—
Gazzara, Peter; Burke, John W., Jr.; and Edwards, Rodney, Jr., 4,324,127, Cl. 73-3.000.

Edwards, William A., to Gallant, Jerry B. Freezing gel containment structure and method. 4,324,111, Cl. 62-457.000.

Efimov, Alexei V.: *See*—
Konstantinov, Igor I.; Kormushechkina, Antonina I.; Avdonin, Jury A.; Kotlyarsky, Vladimir M.; Kim, Albert A.; Obraztsov, Nikolai V.; and Efimov, Alexei V., 4,324,667, Cl. 210-729.000.

Egyt Gyogyszervegyeszeti Gyar: *See*—
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.
Messmer, Andras; Benko, Pal; Hajos, Gyorgy; Petocz, Lujza; Kosoczky, Ibolya; and Gorog, Peter, 4,324,786, Cl. 424-248.540.

Ehling, John W., to Western Electric Company, Inc. Die shear apparatus for trimming wire weld bulges. 4,324,515, Cl. 409-300.000.

Ehrgott, Roland; and Meindl, Gerhard, to Siemens Aktiengesellschaft. Mount for an electromagnetic coil. 4,325,044, Cl. 336-67.000.

Ehrlinger, Klaus: *See*—
Kruger, Roland; Ciongwa, Joachim; Smusch, Gunther; and Ehrlinger, Klaus, 4,324,264, Cl. 134-68.000.

Eimers, Erich; and Dhein, Rolf, to Bayer Aktiengesellschaft. Hydrocarbon, a process for its production and its use as a reactive thinner for air-drying lacquers. 4,324,934, Cl. 585-21.000.

Eisai Co., Ltd.: *See*—
Takahashi, Toshio, 4,325,028, Cl. 324-442.000.

Eisentraut, Kent J.; Ross, William D.; Hillan, William J.; Brooks, Joseph J.; and Duffy, Thomas G., to United States of America, Air Force. Analysis of lubricating oils for iron content. 4,324,758, Cl. 422-61.000.

Eistetter, Klaus; and Rapp, Erich, to BYK Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung. Substituted oxiranecarboxylic acids, their use and medicaments containing them. 4,324,796, Cl. 424-278.000.

Eldon, James, III; Saint, David; and Latone, Thomas L., to Graco Metal Products, Inc. Infant swing carrier. 4,324,432, Cl. 297-377.000.

Electric Power Research Institute, Inc.: *See*—
Guerin, William F., 4,324,619, Cl. 376-290.000.
Moody, Edward, 4,324,614, Cl. 376-175.000.
Sowers, Michael G.; Creek, Ronald B.; and DeFur, Donovan D., 4,324,617, Cl. 376-405.000.

ELF France: *See*—
Jacob, Philippe; and Tondeur, Daniel, 4,324,566, Cl. 55-28.000.

Elfab Corporation: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., 4,324,451, Cl. 339-176.0MP.

Elin-Union AG: *See*—
Schlusselberger, Richard, 4,324,587, Cl. 75-130.00B.

Ellington, Gordon H.: *See*—
Mitchell, William O.; and Ellington, Gordon H., 4,324,087, Cl. 53-241.000.

Ellion, M. Edmund, to Hughes Aircraft Company. Hydrazine thruster. 4,324,096, Cl. 60-200.00R.

Elliston, Thomas L., to Hydra-Rig, Inc. Stabilized hoist rig for deep ocean mining vessel. 4,324,194, Cl. 114-264.000.

Elser, Kirby W. Servicing stand for three wheeled vehicles. 4,324,384, Cl. 254-8.00B.

Elsner, Georg; Vollmer, Hartfrid; and Reutel, Ernst, to Hoechst Aktiengesellschaft. Production of tertiary phosphines. 4,324,919, Cl. 568-8.000.

Eltra Corporation: *See*—
Sieja, Norman F., 4,324,215, Cl. 123-335.000.

Emblem, Harold G.: *See*—
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., 4,324,602, Cl. 156-71.000.

Emerick, Dennis P., to Du Pont de Nemours, E. I., and Company. Low curing epoxy n-resin coating composition. 4,324,715, Cl. 523-400.000.

Endo, Masanori; and Horiuchi, Kentaro, to Tohoku Metal Industries, Ltd. Thermo-magnetically operated switches having two different operating temperatures. 4,325,042, Cl. 335-208.000.

Enertec: *See*—
Heller, Isabelle, 4,325,098, Cl. 361-82.000.

Engelhard Corporation: *See*—
Zysk, Edward D.; and Stephans, Robert, 4,324,588, Cl. 75-208.00R.

English, George P., to General Instrument Corporation. Variable capacitor for use in a keyboard. 4,325,102, Cl. 361-288.000.

Enso-Gutzeit Osakehito : *See*—
Titoff, Juha, 4,324,659, Cl. 210-386.000.

Envirotech Corporation: *See*—
Davis, Steven S., 4,324,116, Cl. 68-158.000.

Erdmannsdorfer, Hans; Bergmann, Horst; and Daudel, Helmut, to Daimler-Benz Aktiengesellschaft. Soot filter for an exhaust arrangement of an internal combustion engine. 4,324,572, Cl. 55-385.00R.

Erhardt, Peter F.: *See*—
Lu, Chin H.; Sherony, Dominic F.; and Erhardt, Peter F., 4,324,851, Cl. 430-106.000.

Eriksson, Gunnar V. Apparatus for removing oil from compressed air. 4,324,573, Cl. 55-396.000.

Erin, Tim: *See*—
Schwob, Charles J.; Kirbabas, Nicholas; and Erin, Tim, 4,324,117, Cl. 68-205.00R.

Erndt, Hans: *See*—
Palloch, Herbert; and Erndt, Hans, 4,324,448, Cl. 339-17.00C.

Eschler, Hans: *See*—
Bulst, Wolf E.; and Eschler, Hans, 4,325,037, Cl. 333-194.000.

ESGE-Marby GmbH & Co.: *See*—
Spingler, Werner, 4,325,108, Cl. 362-183.000.

Esmond, William G. Transfer device having a thin wall plate. 4,324,658, Cl. 210-321.300.

EST Industries, Inc.: *See*—
Tse, Jackson, 4,324,400, Cl. 273-76.000.

Ethyl Corporation: *See*—
McKinnie, Bonnie G.; and Ranken, Paul F., 4,324,920, Cl. 568-54.000.

Eugley, Susan L., to Stauffer Chemical Company. Dough-like products exhibiting reduced water activity containing derived protein-containing compositions. 4,324,811, Cl. 426-656.000.

Euteco Impianti S.p.A.: *See*—
Ghirga, Marcello; Valtorta, Luigi; and Calcagno, Benedetto, 4,324,941, Cl. 585-466.000.

Exxon Production Research Company: *See*—
Cutler, Christopher R., 4,324,193, Cl. 114-199.000.

Exxon Research & Engineering Co.: *See*—
Hall, Richard B., 4,324,766, Cl. 423-3.000.
Patton, Tad L., 4,324,836, Cl. 428-336.000.

Eyerly, Jon V. Bumper car amusement ride. 4,324,301, Cl. 180-2.00R.

Fabrique d'Horlogerie de Fontainemelon: *See*—
Paratte, Daniel, 4,324,992, Cl. 310-49.00R.

Fagan, Joseph P., to Du Pont de Nemours, E. I., and Company. Felt-like layered composite of PTFE and glass paper. 4,324,574, Cl. 55-487.000.

Fairchild Camera & Instrument Corp.: *See*—
Johnson, Nicky M.; and Blaser, Lawrence M., 4,324,216, Cl. 123-415.000.

Faisst, Magdalena: *See*—
Buzzi, Gunther; and Faisst, Magdalena, 4,324,364, Cl. 239-383.000.

Falk, Volker: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,324,918, Cl. 564-503.000.

Fallier, Charles N., Jr.: *See*—
Proud, Joseph M.; Riseberg, Leslie A.; and Fallier, Charles N., Jr., 4,325,004, Cl. 315-45.000.

Fankhauser, Peter, to Firmenich SA. Novel acetylenic compounds useful as starting materials for preparing an alicyclic ketone. 4,324,729, Cl. 260-345.90R.

Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, to Philargo. Herbicidal and phytohormonal amidoximes. 4,324,579, Cl. 71-74.000.

Farr, Glyn P. R., to Girling Limited. Hydraulic master cylinders for vehicle braking systems. 4,324,101, Cl. 60-562.000.

Farris, Richard C., to Western Geophysical Co. of America. Actuator for an air gun having a reciprocating shuttle valve. 4,324,311, Cl. 181-120.000.

Fauth, Frederick E., to American Bottlers Equipment Company, Inc. Can end washer and dryer. 4,324,265, Cl. 134-82.000.

Fauth, Gunter: *See*—
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, 4,324,463, Cl. 354-25.000.

Feher, Tibor: *See*—
Guard, Wayne; and Feher, Tibor, 4,324,370, Cl. 242-86.520.

Feherguard Products: *See*—
Guard, Wayne; and Feher, Tibor, 4,324,370, Cl. 242-86.520.

Ferret, Francois: *See*—
Le Brozec, Pierre; Ferret, Francois; and Doussoux, Pierre, 4,325,053, Cl. 340-347.0DD.

Ferro, Anthony J., to Allis-Chalmers Corporation. Seat centerline operated butterfly valve. 4,324,383, Cl. 251-308.000.

Fertilizer Development S.A.: *See*—
Baniel, Avraham M., 4,324,774, Cl. 423-321.00R.

Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Method of preparing gamma-L-glutamyl taurine. 4,324,743, Cl. 260-513.00N.

Feuerstein, Diane: *See*—
Snyder, William R.; and Feuerstein, Diane, 4,324,664, Cl. 210-701.000.

Fiber Associates, Incorporated: *See*—
Geyer, Charles J., Jr.; and White, Ben E., 4,324,751, Cl. 264-23.000.

Fieni, Gabriel J. Wood carrier. 4,324,428, Cl. 294-169.000.

Finck, Hans-Werner: *See*—
Avar, Lajos; Finck, Hans-Werner; and Kalt, Evelyne, 4,324,628, Cl. 204-159.240.

Finding, Kenneth: *See*—
Bewley, David K.; and Finding, Kenneth, 4,324,979, Cl. 250-505.000.

Firestone Tire & Rubber Company, The: *See*—
Davis, James A.; and Koch, Robert C., 4,324,710, Cl. 524-76.000.
Ravagnani, Frederick J.; and Schonfeld, Steven E., 4,324,281, Cl. 152-359.000.

Firmenich SA: *See*—
Fankhauser, Peter, 4,324,729, Cl. 260-345.90R.

Pickenhagen, Wilhelm; and Velluz, Alain, 4,324,809, Cl. 426-534.000.
Fischer, Martin: *See*—
Kropp, Rudolf; Fischer, Martin; and Halbritter, Klaus, 4,324,725, Cl. 260-343.600.
Fischer, Robert L., to Caterpillar Tractor Co. Lock assembly for earthworking apparatus. 4,324,435, Cl. 299-37.000.
Flagg, Rodger H. Plant growing system utilizing pneumatic pressure. 4,324,069, Cl. 47-62.000.
Flanders Filters, Inc.: *See*—
Wilcox, David E.; and Allan, Thomas T., 4,324,568, Cl. 55-97.000.
Fleming, James C.: *See*—
Adin, Anthony; and Fleming, James C., 4,324,852, Cl. 430-178.000.
Fletcher, James D.: *See*—
O'Connell, Philip E.; Hughes, Larry M.; and Fletcher, James D., 4,325,136, Cl. 369-219.000.
Fly, Walter: *See*—
Goldstein, Henry; Fly, Walter; Ting, Patrick; and Chicoye, Etzer, 4,324,810, Cl. 426-600.000.
Flynn, John J.: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,324,773, Cl. 423-311.000.
FMC Corporation: *See*—
Billett, Ronald J.; and Viitanen, Veikko K., 4,324,108, Cl. 62-345.000.
Blake, John H., 4,324,544, Cl. 432-14.000.
Foerst, Reiner, to Dr.-Ing. Reiner Foerst GmbH. Tuning device for musical instruments. 4,324,166, Cl. 84-454.000.
Fonseca, Anthony G., to Conoco Inc. Pyrite removal from coal. 4,324,560, Cl. 44-1.0SR.
Fontana, Fernando. Adjusting and locking device for watch bracelets. 4,324,024, Cl. 24-170.000.
Ford Motor Company: *See*—
Blair, Howard D.; and Milberg, Morton E., 4,324,356, Cl. 228-193.000.
Fornell, Robert M.: *See*—
McCann, Floyd E.; and Fornell, Robert M., 4,324,283, Cl. 157-1.280.
Forsyth Dental Infirmary for Children: *See*—
Hillman, Jeffrey D., 4,324,860, Cl. 435-172.000.
Fortuna-Werke Maschinenfabrik GmbH: *See*—
Belthle, Heinz, 4,324,073, Cl. 51-281.00R.
Foure, Michel, to Societe Nationale Elf Aquitaine. Thermal stabilization of vinyl resins. 4,324,718, Cl. 524-108.000.
Foure, Michel, to Societe Nationale Elf Aquitaine. Process for the preparation of organostannic trihalides. 4,324,737, Cl. 260-429.700.
Fox, Irwin, to Ironite Products Company. Method of using a reactive iron oxide drilling mud additive. 4,324,298, Cl. 175-64.000.
Fradenburgh, Evan A.; Jepson, William D.; and Moffitt, Robert C., to United Technologies Corp. Helicopter blade with a tip having a selected combination of sweep, taper and anhedral to improve hover efficiency. 4,324,530, Cl. 416-228.000.
Frahm, Veryl H., Jr.: *See*—
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,324,582, Cl. 75-1.00R.
Fraley, Lowell D.: *See*—
Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,324,649, Cl. 208-130.000.
Fram Corporation: *See*—
Peyton, Richard H.; and Thornton, Donald I., 4,324,660, Cl. 210-440.000.
Framatome: *See*—
Marmorat, Andre; and Montaron, Rene, 4,324,616, Cl. 376-203.000.
Frankl & Kirchner GmbH & Co. KG, Fabrik fur Elektromotoren u. elektrische Apparate: *See*—
Palloch, Herbert; and Erndt, Hans, 4,324,448, Cl. 339-17.00C.
Franklin Electric Co., Inc.: *See*—
Schaefer, Edward J., 4,325,012, Cl. 318-786.000.
Franklin Industries, Inc.: *See*—
Schwartz, Larry A., 4,324,223, Cl. 126-200.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Oellerer, Friedrich, 4,324,186, Cl. 105-177.000.
Frappier, Michael B., to Thermal Dynamics Corporation. Torch height acquisition using arc transfer. 4,324,971, Cl. 219-121.0PV.
Freedman, Murray; Vale, Arthur E.; and Vale, Peter R., to Vale, Arthur E. Brassiere having a bottom stretch band. 4,324,254, Cl. 128-494.000.
Frei, Paul, to Griesser A. G. Venetian blind. 4,324,284, Cl. 160-172.000.
Frick Company: *See*—
Garland, Milton W., 4,324,109, Cl. 62-353.000.
Fried, Josef, to University of Chicago, The. Certain fluorine substituted PGI_2 compounds. 4,324,730, Cl. 260-346.220.
Friedman, Harold L.: *See*—
Garwin, Richard L.; and Friedman, Harold L., 4,324,020, Cl. 17-51.000.
Friedman, Michael E. Animal safety restraint for vehicles. 4,324,204, Cl. 119-96.000.
Friese, Wayne G. Grain carrying vehicle. 4,324,434, Cl. 298-27.000.
Frishberg, Mark D., to Eastman Kodak Company. 2-Amino-5-cyanothiazoles and their preparation. 4,324,899, Cl. 548-190.000.
Fritz, William E., to Youngstown Steel Door Company, The. Hopper discharge outlet and method. 4,324,188, Cl. 105-282.00R.
Froelich, Joseph A.: *See*—
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., 4,324,698, Cl. 252-455.00Z.
Frohlich, Walter: *See*—
Link, Gerhard; Riedl, Josef; Frohlich, Walter; and Krumbock, Reinhard, 4,324,932, Cl. 570-226.000.
Frost, Ralph S., to Chemetron Railway Products, Inc. Locator for rail aligning device. 4,324,048, Cl. 33-180.00R.
Frye, Robert B., to General Electric Company. Silicone resin coating composition. 4,324,839, Cl. 428-412.000.
Frymaster Corporation, The: *See*—
Moore, L. Frank; and Price, George M., 4,324,173, Cl. 99-330.000.
Fuji Photo Film Co., Ltd.: *See*—
Fukushima, Osamu; Akisada, Masahide; and Koizumi, Takashi, 4,324,478, Cl. 354-312.000.
Noguchi, Masaru; Oosaka, Shigenori; and Komura, Tsuneo, 4,324,452, Cl. 350-6.700.
Oishi, Yasushi; and Hirano, Shigeo, 4,324,855, Cl. 430-378.000.
Seto, Kunihira; and Naruo, Kyoichi, 4,324,705, Cl. 521-44.000.
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.
Fujii, Hironory; Nagashima, Thuyoshi; and Shibamoto, Nobuyori, to Sugai Chemical Industry Co., Ltd. Process for separation of naphthalenedisulfonic acids. 4,324,742, Cl. 260-505.00C.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hemmi, Keiji; and Goto, Jiro, 4,324,892, Cl. 544-28.000.
Fujiwara, Kenichi; Sugi, Hikaru; and Nishikawa, Mineo, to Nippondenso Co., Ltd. Refrigeration system. 4,324,112, Cl. 62-511.000.
Fujiyama, Masaaki: *See*—
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.
Fukazawa, Hidehalu: *See*—
Akasaki, Isamu; Ohsima, Masaaki; Matsuda, Nobuhide; Matsuki, Michio; Tsukamoto, Yoshio; Kagi, Hiromichi; and Fukazawa, Hidehalu, 4,325,070, Cl. 346-108.000.
Fukuda, Masakatsu: *See*—
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Fukumura, Kagenori: *See*—
Ushijima, Fumihiro; and Fukumura, Kagenori, 4,324,321, Cl. 192-13.00R.
Fukushima, Osamu; Akisada, Masahide; and Koizumi, Takashi, to Fuji Photo Film Co., Ltd. Photosensitive sheet handling method and device. 4,324,478, Cl. 354-312.000.
Fulberth: *See*—
Dahlhausen, Gebhard; Dibbern, Hans-Werner; Fulberth; and Ross, Gerhard, 4,324,779, Cl. 424-20.000.
Furka, Arpad: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,324,743, Cl. 260-513.00N.
Furrer, Alfred; and Wehrli, Hans, to Laser-Work A.G. Process and device for laser-beam melting and flame cutting. 4,324,972, Cl. 219-121.0FS.
Furuichi, Minoru; Honma, Chikara; and Ando, Noriaki, to Japan Synthetic Rubber Co., Ltd. Thermoplastic elastomer composition. 4,324,866, Cl. 521-140.000.
Futaba Denshi Kogyo K.K.: *See*—
Kishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, 4,325,064, Cl. 340-753.000.
G A O Gesellschaft fur Automation and Organisation mbH: *See*—
Mitzel, Wilhelm; and Bernardi, Herbert, 4,324,394, Cl. 271-5.000.
G. D. Searle & Co.: *See*—
Miyano, Masateru; and Dorn, Clifford R., 4,324,902, Cl. 560-53.000.
Gabor, Andrew, to Xerox Corporation. Print hammer assembly with amplified multi-location impacts. 4,324,497, Cl. 400-144.200.
Gagnon, Pierre; and LaForest, Pierre. Battens system for raising and lowering sceneries or similar loads on a stage. 4,324,386, Cl. 254-288.000.
Gallant, Jerry B.: *See*—
Edwards, William A., 4,324,111, Cl. 62-457.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Combustion chamber for an internal combustion engine. 4,324,214, Cl. 123-309.000.
Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrocracking, hydrodesulfurization, and/or hydrodenitrogenation of organic compounds employing promoted zinc titanate and a zeolite as the catalytic agent. 4,324,647, Cl. 208-111.000.
Gardner, Tommy R.: *See*—
Norman, Lewis R.; and Gardner, Tommy R., 4,324,669, Cl. 252-8.55C.
Garland, Milton W., to Frick Company. Ice-making apparatus with hot gas defrost. 4,324,109, Cl. 62-353.000.
Garnier, Jacques P.; Garnier, Marcel A.; and Moreau, Rene J., to Agence Nationale de Valorisation de le Recherche (ANVAR). Process and device for confining liquid metals by use of an electromagnetic field. 4,324,266, Cl. 137-13.000.
Garnier, Marcel A.: *See*—
Garnier, Jacques P.; Garnier, Marcel A.; and Moreau, Rene J., 4,324,266, Cl. 137-13.000.
Garrett, Michael E. Apparatus for the treatment of liquids. 4,324,657, Cl. 210-197.000.
Garwin, Richard L.; and Friedman, Harold L. Mussel washer. 4,324,020, Cl. 17-51.000.
Gasser, Max. Vibration dampened for archery bow. 4,324,222, Cl. 124-89.000.

Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Process for the homologization of methanol. 4,324,927, Cl. 568-902.000.
Gaviraghi, Giovanni: *See*—
Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, 4,324,788, Cl. 424-250.000.
Gay, Michael J., to Motorola, Inc. Comparison circuit adaptable for utilization in a television receiver or the like. 4,324,990, Cl. 307-350.000.
Gaylord, Richard P.; and Miller, Wendell E., to Clark Equipment Company. Fluid device and method for making. 4,324,171, Cl. 92-169.000.
Gazzara, Peter; Burke, John W., Jr.; and Edwards, Rodney, Jr., to Biotrine Corporation. Spirometer calibration device and associated displacement detection system. 4,324,127, Cl. 73-3.000.
GCA Corporation: *See*—
Dunham, Richard M., 4,325,077, Cl. 358-107.000.
Gebler, Kenneth A., to Nalco Chemical Company. Basic (MgO) non-aqueous plastic refractory mixture. 4,324,862, Cl. 501-109.000.
Geier, Georg; and Lohne, Manfred, to WABCO Steuerungstechnik. Control system for regulating a spray gun paint pressure. 4,324,366, Cl. 239-533.100.
Geiger, Gary E.; and May, Roger C., to Betz Laboratories, Inc. Stable compositions for use as corrosion inhibitors. 4,324,684, Cl. 252-389.00A.
Geisser, Stephan, to Graf & Cie. A.-G. Apparatus for retracting flats from the cast iron flat bars of carding machines. 4,324,029, Cl. 29-239.000.
Gelleri, Andras: *See*—
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.
GEMA AG Apparatebau: *See*—
Moos, Kurt; and Buschor, Karl, 4,324,361, Cl. 239-3.000.
General Dynamics Corporation: *See*—
O'Neill, Richard F., 4,324,375, Cl. 244-163.000.
General Dynamics, Pomona Division: *See*—
Piesik, Edward T., 4,324,167, Cl. 89-1.800.
General Electric Company: *See*—
Borland, Walter G.; and Brehse, Robert F., 4,325,008, Cl. 315-241.00R.
Frye, Robert B., 4,324,839, Cl. 428-412.000.
Harris, Lawrence A., 4,324,760, Cl. 422-98.000.
Harris, Lawrence A., 4,324,761, Cl. 422-98.000.
Kim, Bang M., 4,324,776, Cl. 423-550.000.
Nickels, Aubrey G., 4,324,529, Cl. 416-187.000.
Smith, Peter H., 4,324,968, Cl. 219-10.55F.
Takekoshi, Tohru, 4,324,882, Cl. 528-206.000.
Vaughn, Howard A., Jr., 4,324,712, Cl. 524-767.000.
White, Dwain M.; and Keyes, David G., 4,324,883, Cl. 528-207.000.
White, Dwain M.; and Keyes, David G., 4,324,884, Cl. 528-207.000.
White, Dwain M.; and Keyes, David G., 4,324,885, Cl. 528-207.000.
Will, Fritz G., 4,324,848, Cl. 429-228.000.
General Foods Corporation: *See*—
Katz, Saul N., 4,324,840, Cl. 426-422.000.
Kim, Myung K.; and Lugay, Joaquin C., 4,324,807, Cl. 426-104.000.
Ray, George C., III, 4,324,823, Cl. 428-43.000.
General Instrument Corporation: *See*—
English, George P., 4,325,102, Cl. 361-288.000.
General Motors Corporation: *See*—
Spurlin, Stephen F.; Lentz, Carl A.; and Miller, Clement P., 4,324,320, Cl. 188-271.000.
General Semiconductor Industries, Inc.: *See*—
Clark, O. Melville, 4,325,097, Cl. 361-56.000.
General Signal Corporation: *See*—
Wuebker, Robert A., 4,324,596, Cl. 148-11.50A.
General Tire & Rubber Co., The: *See*—
Alexander, Joseph H.; and Jellison, Frank R., 4,324,604, Cl. 156-131.000.
Genese, Joseph N.; and Muetterties, Andrew J., to Abbott Laboratories. Equipment sets having a combined air barrier and liquid sequencing device for the sequential administration of medical liquids at dual flow rates. 4,324,238, Cl. 128-214.00G.
Gentex Corporation: *See*—
Wagner, William E.; and Zachev, Ivan, 4,325,058, Cl. 340-562.000.
George, Patricia M.: *See*—
Beauchamp, Jesse L.; and George, Patricia M., 4,324,854, Cl. 430-296.000.
Geratz, Joachim D.: *See*—
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,324,794, Cl. 424-273.00B.
Gerharz, Reinhold, to United States of America, Army. Optical test pattern. 4,324,459, Cl. 351-32.000.
Gerkin, William C.: *See*—
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,324,104, Cl. 62-77.000.
Gerry, Martin E. Fuel and water homogenizer and vaporizer and method therefor. 4,324,209, Cl. 123-25.00B.
Gewerkschaft Eisenhutte Westfalia: *See*—
Dreher, Hans-Joachim; and Becker, Kunibert, 4,324,510, Cl. 405-291.000.
Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Incorporated. Process for preparing viscose rayon. 4,324,751, Cl. 264-23.000.
Ghirga, Marcello; Valtorta, Luigi; and Calcagno, Benedetto, to Euteco Impianti S.p.A. Process for the production of cumene. 4,324,941, Cl. 585-466.000.
Ghose, Rabindra N. Intercontinental air to air communications by an optimum mode. 4,325,141, Cl. 455-63.000.
Giacone, Felice. Control unit for a serial printer. 4,324,499, Cl. 400-144.200.
Gibbs, Dale S.; Sinacola, James F.; and Ranck, Dan E., to Dow Chemical Company, The. Vinylidene chloride polymer microgel powder lacquer coating composition and substrates coated therewith. 4,324,714, Cl. 524-113.000.
Gilbert, Herman S., to Dow Chemical Company, The. Compositions containing β-diketo chelating compounds. 4,324,676, Cl. 252-79.000.
Gilden, Meyer, to United Technologies Corporation. PRF Stabilized surface acoustic wave oscillator. 4,325,032, Cl. 331-25.000.
Gill, Robert A. Method of producing an air laid paper web utilizing microencapsulated hydrogen bond promoting material. 4,324,753, Cl. 264-121.000.
Gillette Company, The: *See*—
Trotta, Robert A., 4,324,041, Cl. 30-47.000.
Gillingham, Larry A.: *See*—
Lunden, Sidney L.; and Gillingham, Larry A., 4,324,521, Cl. 414-42.000.
Gilmore, John F.; and Lopenski, Stanley A., to Westinghouse Electric Corp. Base and terminal-pin assembly for an electric lamp. 4,324,998, Cl. 313-318.000.
Ginley, Maynard. Control system for legless operation of motor vehicles. 4,324,309, Cl. 180-316.000.
Ginsberg, Martin: *See*—
Janak, Miloslav; Ginsberg, Martin; and Reiners, Albrecht, 4,325,090, Cl. 360-51.000.
Ginster, Helmut, to Draftex Development, A.G. Finishing and sealing strips. 4,324,826, Cl. 428-122.000.
Girard, Pierre: *See*—
Colardelle, Joel S.; Girard, Pierre; and Pillou, Jean-Pierre M., 4,325,055, Cl. 340-347.0AD.
Girling Limited: *See*—
Farr, Glyn P. R., 4,324,101, Cl. 60-562.000.
Gisiger, Urs, to Amiet AG. Permutation lock, particularly for handbags and suitcases. 4,324,120, Cl. 70-312.000.
Gitlitz, Melvin H.; and Russo, David A., to M&T Chemicals Inc. Fungicidal bis(substituted phenyl)alkyltin compounds. 4,324,798, Cl. 424-288.000.
Gladd Industries, Inc.: *See*—
Hubbert, Gordon F., 4,324,545, Cl. 432-223.000.
Glasson, Richard E.: *See*—
Kasting, Edward W.; Glasson, Richard E.; and Primus, Roy J., 4,324,213, Cl. 123-196.00A.
Glatfelter, Edward W.: *See*—
Baier, Robert J.; and Glatfelter, Edward W., 4,324,233, Cl. 128-58.000.
Glaxo Group Limited: *See*—
Bradshaw, John; Oxford, Alexander W.; and Scopes, David I. C., 4,324,792, Cl. 424-267.000.
Glockner, Hermann: *See*—
Schrecke, Horst G.; and Glockner, Hermann, 4,324,442, Cl. 308-187.000.
Gneth nee Zalantai, Livia: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth nee Zalantai, Livia, 4,324,903, Cl. 560-82.000.
Godar, Serge E. Installation for the withdrawal and purification treatment of waters and aqueous effluents. 4,324,656, Cl. 210-170.000.
Goetze AG: *See*—
Buchfeld, Jurgen, 4,325,125, Cl. 364-474.000.
Golan, Kenneth F.; Goloff, Charles N.; and Schmitt, James L., to Caterpillar Tractor Co. Selector valve. 4,324,274, Cl. 137-625.680.
Golden, Edward J.: *See*—
Sano, Frank M.; Sliwa, Robert A.; and Golden, Edward J., 4,324,168, Cl. 89-1.814.
Goldfarb, Charles; and Iglitzki, Claude. Tamper-proof hanger. 4,324,352, Cl. 223-91.000.
Goldmacher, Jerome. Safety harness. 4,324,205, Cl. 119-96.000.
Goldsmid, Hiroshi J., to Unisearch Limited. Method and means for distinguishing gemstones. 4,324,129, Cl. 73-15.00A.
Goldstein, Henry; Fly, Walter; Ting, Patrick; and Chicoye, Etzer, to Miller Brewing Company. Hop extracts and method of preparation. 4,324,810, Cl. 426-600.000.
Golick, Leonard R.: *See*—
Cooper, Frank W., Jr.; and Golick, Leonard R., 4,325,026, Cl. 324-232.000.
Goloff, Charles N.: *See*—
Golan, Kenneth F.; Goloff, Charles N.; and Schmitt, James L., 4,324,274, Cl. 137-625.680.
Gooch, Robert P., to Digital Communications Corporation. Method and apparatus for adaptive facsimile compression using a two dimensional maximum likelihood predictor. 4,325,085, Cl. 358-261.000.
Goode, Sidney H.: *See*—
Brantley, Zachry G.; and Goode, Sidney H., 4,324,353, Cl. 226-118.000.
Goodman, Alan: *See*—
Goodson, Louis H.; and Goodman, Alan, 4,324,858, Cl. 435-20.000.
Goodman, Donald: *See*—
Cordes, William F., III; Goodman, Donald; and Miller, Robert S., 4,324,874, Cl. 526-84.000.
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Gottlieb, John D., to Standard Microsystems Corporation. Tool for removing integrated circuits from a burn-in board. 4,324,040, Cl. 29-829.000.

Gotzenberger, Adolf: *See—*
Schneeweiss, Manfred; Gotzenberger, Adolf; and Ohm, Aloys, 4,324,416, Cl. 280-661.000.

Gould Inc.: *See—*
Zaghi, Hooshmand; and Tisone, Thomas C., 4,325,048, Cl. 338-3.000.

Goupy, Francois M.: *See—*
Hirel, Jean C.; Goupy, Francois M.; Bloch, Pierre G.; and Degoulet, Patrice E., 4,324,663, Cl. 210-646.000.

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Eldon, James, III; Saint, David; and Latone, Thomas L., 4,324,432, Cl. 297-377.000.

Grady, Clyde C., II. Structural units and arrays therefrom. 4,324,037, Cl. 29-469.000.

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Geisser, Stephan, 4,324,029, Cl. 29-239.000.

Graham, Donald W.; Rogers, Edward F.; and Kahan, Frederick M., to Merck & Co., Inc. Renal dipeptidase inhibitors. 4,324,733, Cl. 260-402.500.

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Grandjean, Rene, to Mars-Actel. Connector for connecting electric conductors together. 4,324,949, Cl. 174-71.00R.

Grandmaison, John P.; Huettner, Robert E.; Vernon, John H.; and Yu, Kin C., to Honeywell Information Systems Inc. Process and apparatus employing microprogrammed control commands for transferring information between a control processor and communications channels. 4,325,119, Cl. 364-200.000.

Grasselli, Robert K.; and Guttmann, Andrew T., to Standard Oil Company. Preparation of unsaturated acids and esters from saturated carboxylic acid derivatives and carbonyl compounds over phosphate catalysts. 4,324,908, Cl. 560-210.000.

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Graves, Bernard A.: *See—*
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Gravisse, Philippe. Solar radiation concentrator. 4,324,946, Cl. 136-247.000.

Gray, Charles R., to H. H. Robertson Company. Fire-resistant floor structure. 4,324,078, Cl. 52-221.000.

Gray, John B.: *See—*
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Green, William A., to ACF Industries, Inc. Carburetor improvement for part throttle vacuum staging. 4,324,746, Cl. 261-51.000.

Greene, Ronald W.; and Marshall, John L. Transcutaneous pain control and/or muscle stimulating apparatus. 4,324,253, Cl. 128-421.000.

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Grettenberg, Thomas L. Overwater radar navigation system. 4,325,066, Cl. 343-7.0ED.

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Frei, Paul, 4,324,284, Cl. 160-172.000.

Griesshaber, Karl H., to Ampex Corporation. Digital measurement system for automatically focusing a television camera. 4,325,082, Cl. 358-218.000.

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Groth, Edward J., Jr., to Motorola Inc. Non-linear logic module for increasing complexity of bit sequences. 4,325,129, Cl. 364-717.000.

Groutage, Frederick D., to United States of America, Navy. High-torque/acceleration stabilized sensor platform. 4,324,378, Cl. 248-184.000.

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Oman, Richard A., 4,324,985, Cl. 290-55.000.

Grundy, Reed H., to American Standard Inc. Vital electronic time delay circuit. 4,325,101, Cl. 361-195.000.

Grunert, Wilfried: *See—*
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Proud, Joseph M.; Riseberg, Leslie A.; and Fallier, Charles N., Jr., 4,325,004, Cl. 315-45.000.

GTE Products Corporation: *See—*
Broadt, David R., 4,324,543, Cl. 431-359.000.
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Guard, Wayne; and Feher, Tibor, to Feherguard Products. Pool cover roller assembly. 4,324,370, Cl. 242-86.520.

Guenther, Carl D. Easy-on tire chains. 4,324,278, Cl. 152-213.00R.

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Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, to Roussel Uclaf. Antipsychotic tetrahydropyridinyl-indoles, compositions and method of use. 4,324,790, Cl. 424-263.000.

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Baier, Robert J.; and Glatfelter, Edward W., 4,324,233, Cl. 128-58.000.

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Gurries, Albert G. Bow-mounted propeller driven boat. 4,324,551, Cl. 440-28.000.

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Guttmann, Andrew T.: *See—*
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Hack, Albert G., to Crescent Engineering Company. Flotation method and apparatus for recovering crude oil from tar-sand. 4,324,652, Cl. 209-3.000.

Hagen, Helmut; Reuther, Wolfgang; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. 4-Nitro-2-trichloromethylphenyl disulfides. 4,324,793, Cl. 424-270.000.

Hagen, Magnus F.; and Rask, Richard O., to Standard Precision, Inc. Anti-rack system for wide drawers and the like. 4,324,439, Cl. 308-3.800.

Hager, Horst, to Hightrack Computer Technik GmbH. Drive unit with a motor. 4,324,994, Cl. 310-68.00R.

Hahn, Karl; and Kampf, Wolfgang, to Chemische Werke Huels, AG. Process for preparing reaction products of conjugated diolefins and aromatic hydrocarbons. 4,324,939, Cl. 585-438.000.

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Hall, John E., to University of Virginia Alumni Patents Foundation. Aspirating culture catheter and method of use. 4,324,262, Cl. 128-756.000.

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Wong, Kenny; and Hall, Wilbur L., 4,324,291, Cl. 166-252.000.

Halliburton Company: *See—*
Harris, Lawrence E., 4,324,668, Cl. 252-8.55C.
Norman, Lewis R.; and Gardner, Tommy R., 4,324,669, Cl. 252-8.55C.

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Hushbeck, Donald F., 4,324,293, Cl. 166-317.000.

Halls, Lawrence M.; and McIlwain, Irwin D., to Sperry Corporation. Cutterbar wear strip. 4,324,092, Cl. 56-298.000.

Hamilton Glass Products Incorporated: *See—*
Willis, Larry G., 4,324,332, Cl. 206-454.000.

Hamilton, Jarrette A., to Union Carbide Corporation. Supersonic injection of oxygen in cupolas. 4,324,583, Cl. 75-43.000.

Hammett, Dillard S. Subsea blowout containment method and apparatus. 4,324,505, Cl. 405-60.000.

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Hanashima, Shigeharu: *See*—
Sugita, Toshio; Morinushi, Takanobu; and Hanashima, Shigeharu, 4,324,630, Cl. 204-192.00R.

Hanna Mining Company, The: *See*—
Rule, William T., 4,324,654, Cl. 209-166.000.

Hans Grohe GmbH & Co. KG: *See*—
Buzzi, Gunther; and Faisst, Magdalena, 4,324,364, Cl. 239-383.000.

Hanson, Richard W., to R. A. Hanson Co., Inc. Concrete pressure monitoring device for monolithic concrete structure forming apparatus. 4,324,539, Cl. 425-59.000.

Hara, Takanori; Yoshinaga, Makoto; Yano, Haruto; and Matumura, Noriyasu, to Toyo Kogyo Co., Ltd. Switch position indicating means for automobiles. 4,324,986, Cl. 307-10.0LS.

Harada, Masato; Yamada, Sadahiko; Suzuki, Atsushi; and Masuda, Jun, to Chisso Corporation. Method for producing olefin polymers. 4,324,875, Cl. 526-115.000.

Harbison, William H.: *See*—
Mohnach, Michael G.; and Harbison, William H., 4,324,019, Cl. 15-250.320.

Harrah, Shane. Automatically-controlled buoyancy vest. 4,324,507, Cl. 405-186.000.

Harris Corporation: *See*—
Smiley, Charles F., 4,324,952, Cl. 179-1.0GS.

Harris, Lawrence A., to General Electric Company. Hydrogen detector. 4,324,760, Cl. 422-98.000.

Harris, Lawrence A., to General Electric Company. Hydrogen detector. 4,324,761, Cl. 422-98.000.

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Harrison, Anthony W.; and Brown, Peter W., to Lucas Industries Limited. Vehicle brakes with automatic slack adjusters. 4,324,319, Cl. 188-79.50K.

Hart, Guy D.: *See*—
Hart, Lena M.; Hart, Ronald J.; and Hart, Guy D., 4,324,089, Cl. 54-24.000.

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Hart, Russell F., to Bendix Corporation, The. Means for limiting power dissipated in an A.C. motor. 4,325,095, Cl. 361-23.000.

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Hartshorn, Angus J.; and Jones, Eric, to Imperial Chemical Industries Limited. Catalyst component. 4,324,691, Cl. 252-429.00B.

Harvey, Donald M., to Eastman Kodak Company. Camera adapted to faciliate removal and reuse of partially exposed film cassettes. 4,324,469, Cl. 354-214.000.

Harvey, Ronald B.: *See*—
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Harwood, Leopold A.; and Wittmann, Erwin J., to RCA Corporation. Electronic filter for generating a third harmonic signal. 4,325,076, Cl. 358-31.000.

Hasegawa, Shoichi; Yamashita, Thoru; and Kameda, Mitsuo, to International Resources Company, Ltd. Apparatus for continuous leaching of ores. 4,324,764, Cl. 422-159.000.

Hashimoto, Hiroshi; Kaneko, Masaru; and Kuge, Yoshihiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Crawler-type lower machinery. 4,324,304, Cl. 180-9.520.

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Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Tochikiyo; Hashimoto, Otokuma; and Mori, Hideki, 4,324,815, Cl. 427-96.000.

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Tagawa, Kazuaki; Suzuki, Minoru; and Hashimoto, Makoto, 4,324,483, Cl. 355-3.0DD.

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Inada, Masami; Hashimoto, Nobuyuki; and Satomoto, Atsushi, 4,325,047, Cl. 337-370.000.

Hashimoto, Otokuma: *See*—
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Hass, Henry B. Process for manufacture of aluminum. 4,324,585, Cl. 75-68.00B.

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Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,324,728, Cl. 260-345.200.

Hatakeyama, Hideo; and Yamamoto, Toru, to Japan Styrene Paper Corporation. Process and apparatus for extruding plastic foams through a fluorocarbon lined die shaping means having extended wear characteristics. 4,324,748, Cl. 264-51.000.

Hatayama, Suinchi, to Hitachi, Ltd. Magnetron. 4,325,003, Cl. 315-39.510.

Hattori, Tadashi; and Ueno, Yoshiki, to Nippon Soken, Inc. Air-fuel ratio detecting system. 4,324,218, Cl. 123-440.000.

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Hauser, Hans: *See*—
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Wada, Moriyasu; Suzuki, Shuichi; Sanada, Shinichi; and Hayase, Shuzi, 4,324,873, Cl. 525-507.000.

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Sasaki, Katsuhiko; Sakaba, Masaru; and Hayashi, Kingo, 4,324,051, Cl. 34-20.000.

Hayashi, Mikio, to Hayashi Seiko Kabushiki Kaisha. Spark intensifier in gasoline engine. 4,324,219, Cl. 123-620.000.

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Ishihara, Takeo; Inoue, Hidehiko; Kishizawa, Yuji; and Hayashi, Tsutomu, 4,324,306, Cl. 180-228.000.

Hayes, Ronald J., to Dow Chemical Company, The. Laminate film structures from chlorinated polyethylenes. 4,324,829, Cl. 428-215.000.

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Healy, James J., to United States of America, Army. Residue-accommodation means for a gas-operated gun. 4,324,170, Cl. 89-159.000.

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Heffer, John P., to Johnson Matthey Public Limited Company. Process for preparing platinum group metal catalysts. 4,324,700, Cl. 252-472.000.

Heiberger, Francis E., to Danly Machine Corporation. Dual motor drive for machine tool. 4,325,015, Cl. 318-625.000.

Heidenreich, Karl-Heinz; and Wachtelborn, Helmut, to Wandel & Goltermann GmbH & Co. System for measuring signal levels. 4,325,024, Cl. 324-99.00D.

Heineman, Samuel, III. Artificial flower and method for making the same. 4,324,821, Cl. 428-24.000.

Heinrich, Benedict: *See*—
Arcan, Mircea; and Heinrich, Benedict, 4,324,547, Cl. 433-71.000.

Heinz, Kamp, to W. Schlafhorst & Co. Device for the transfer of a coil tube. 4,324,346, Cl. 221-171.000.

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Samuel, Olof; and Hellemaa, Heikki, 4,324,212, Cl. 123-179.00F.

Heller, Isabelle, to Enertec. Detection of the position of a fault on an electric link. 4,325,098, Cl. 361-82.000.

Helzig, Lloyd M.: *See*—
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Henchiri, Amar; Cecile, Jean-Luc; Baudet, Gerard; Barbery, Gilles; and Bloise, Rene, to Bureau de Recherches Geologiques et Minieres. Process for the treatment of phosphate ores with silico-carbonate gangue. 4,324,653, Cl. 209-167.000.

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Herbig, Eugene O., to Royal Maid, Inc. Self-wringing mop. 4,324,016, Cl. 15-119.00A.

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Hermalahti, Raimo K. Article support rack. 4,324,337, Cl. 211-89.000.

Herman, Morton B., to Redactron Corporation. Display device with variable capacity buffer memory. 4,325,063, Cl. 340-750.000.

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Hewitt, Norman S., to Continental Group, Inc., The. Pallet and method of loading vehicles utilizing same. 4,324,190, Cl. 108-51.100.

Heyden, Donald H.: *See—*
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Ogawa, Yukio; and Hirohata, Michio, 4,324,471, Cl. 354-234.000.

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Sasaki, Katsuhiko; Sakaba, Masaru; and Hayashi, Kingo, 4,324,051, Cl. 34-20.000.

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Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Nakai, Hiromitu, 4,324,850, Cl. 430-24.000.

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Aruga, Taketo; Morita, Koichi; Hoashi, Kenzo; and Kojima, Yasuo, 4,324,098, Cl. 60-420.000.

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van Gorkom, Gerardus G. P.; and Hoeberechts, Arthur M. E., 4,325,084, Cl. 358-241.000.

Hoechst Aktiengesellschaft: *See—*
Arpe, Hans-Jurgen, 4,324,921, Cl. 568-427.000.
Dahlhausen, Gebhard; Dibbern, Hans-Werner; Fulberth; and Ross, Gerhard, 4,324,779, Cl. 424-20.000.
Elsner, Georg; Vollmer, Hartfrid; and Reutel, Ernst, 4,324,919, Cl. 568-8.000.
Koch, Manfred; Mildenberger, Hilmar; and Sachse, Burkhard, 4,324,799, Cl. 424-301.000.
Moraw, Roland; Steinau, Peter; and Pierson, Fritz, 4,324,421, Cl. 283-7.000.
von Halasz, Sigmar-Peter, 4,324,930, Cl. 570-134.000.
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Brantley, Zachry G.; and Goode, Sidney H., 4,324,353, Cl. 226-118.000.

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Graham, Donald A.; Hoffman, Delwin R.; and Morton, Peter M., 4,325,123, Cl. 364-431.070.

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Kruger, Roland; Ciongwa, Joachim; Smusch, Gunther; and Ehrlinger, Klaus, 4,324,264, Cl. 134-68.000.

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Ishihara, Takeo; Inoue, Hidehiko; Kishizawa, Yuji; and Hayashi, Tsutomu, 4,324,306, Cl. 180-228.000.

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Severson, Asbjorn M., 4,324,028, Cl. 29-157.30C.

Honeywell Information Systems Inc.: *See—*
Grandmaison, John P.; Huettner, Robert E.; Vernon, John H.; and Yu, Kin C., 4,325,119, Cl. 364-200.000.
Parmet, Arthur A.; and Dawson, Charles W., 4,325,117, Cl. 364-200.000.

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Furuichi, Minoru; Honma, Chikara; and Ando, Noriaki, 4,324,866, Cl. 521-140.000.

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Hope, Henry F.; and Hope, Stephen F. Apparatus for processing photographic materials. 4,324,354, Cl. 226-189.000.

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Endo, Masanori; and Horiuchi, Kentaro, 4,325,042, Cl. 335-208.000.

Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., to United States of America, Army. Noncontact thermal interface. 4,324,104, Cl. 62-77.000.

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Hornsby, Roger L. Swimming pool and water supply system. 4,324,009, Cl. 4-492.000.

Horvitz, David; and Brima, Thomas S., to National Distillers & Chemical Corp. Process for preparing glycols and glycol esters. 4,324,909, Cl. 560-246.000.

Houlberg, Don M.; Anderson, Larry D.; and Damico, Frank M., to Joerns Furniture Company. Drive unit for adjustable beds. 4,324,010, Cl. 5-68.000.
House, David W., to UOP Inc. Chiral supports for resolution of racemates. 4,324,681, Cl. 252-184.000.
House, John I. Hydraulically controlled mirror. 4,324,100, Cl. 60-545.000.
Howarth, Harry, to Varian Techtron Pty. Ltd. Nebulizer. 4,324,365, Cl. 239-424.000.
Howson, Barry R. Method of cleaning fibreglass. 4,324,678, Cl. 252-136.000.
Hrizo, John; Bauerle, James E.; and Witkowski, Robert E., to Westinghouse Electric Corp. Alkali ionization detector. 4,325,029, Cl. 324-468.000.
Hsu, Da L. System for safeguarding magnetically recorded data. 4,325,089, Cl. 360-15.000.
Huang, Jen-chi, to Polychrome Corporation. Lithographic substrates. 4,324,841, Cl. 428-457.000.
Huang, Laurence P. Y.: *See—*
Huang, Vincent P. W.; and Huang, Laurence P. Y., 4,324,427, Cl. 293-106.000.
Huang, Vincent P. W.; and Huang, Laurence P. Y. Automobile bumper with adiabatic device. 4,324,427, Cl. 293-106.000.
Hubbert, Gordon F., to Gladd Industries, Inc. Recirculating heater for processing oven. 4,324,545, Cl. 432-223.000.
Huck Manufacturing Company: *See—*
Dixon, Richard D., 4,324,518, Cl. 411-361.000.
Hueber, Werner G., to United States of America, Navy. Dual mode guidance system. 4,324,491, Cl. 356-152.000.
Huebscher, Werner; and Anliker, Max. Ultrasonic doppler flowmeters. 4,324,258, Cl. 128-663.000.
Huettner, Robert E.: *See—*
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Hughes Aircraft Company: *See—*
Ellion, M. Edmund, 4,324,096, Cl. 60-200.00R.
Mastrup, Frithjof N.; and Marabella, Leonard J., 4,324,765, Cl. 422-173.000.
Wittmann, Alois; and Rubin, Charles P., 4,324,374, Cl. 244-158.00R.
Hughes, Brian T.; Redstone, Reuben; Vokes, John C.; and Wight, David R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Field effect devices and their fabrication. 4,325,073, Cl. 357-22.000.
Hughes, Donald R. Tubular key manufacturing machine. 4,324,513, Cl. 409-82.000.
Hughes, Larry M.: *See—*
O'Connell, Philip E.; Hughes, Larry M.; and Fletcher, James D., 4,325,136, Cl. 369-219.000.
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Humiston, Gerald F. Binary vapor cycle method of electrical power generation. 4,324,983, Cl. 290-1.00R.
Hungerford, Gordon P., to Mobil Oil Corporation. Flowable polyacrylonitrile power treated with essentially pure solvent. 4,324,707, Cl. 524-173.000.
Hunt, John E., to DuTone Corporation. Method of removing ferrocyanide ions from rinse water of an alkaline cyanide metal plating process. 4,324,666, Cl. 210-722.000.
Hushbeck, Donald F., to Halliburton Services. Circulation valve. 4,324,293, Cl. 166-317.000.
Hydra-Rig, Inc.: *See—*
Elliston, Thomas L., 4,324,194, Cl. 114-264.000.
Hydril Company: *See—*
Blose, Thomas L., 4,324,049, Cl. 33-199.00B.
Hydrodynamic Energy Systems Corp.: *See—*
Borgren, Peter M., 4,324,984, Cl. 290-54.000.
Hylton, Thomas A.; and Walker, Jerry A., to Upjohn Company, The. Processes for the preparation of hydratropic acids and esters. 4,324,904, Cl. 560-102.000.
I.S.F. S.p.A.: *See—*
Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, 4,324,788, Cl. 424-250.000.
Ichikawa, Hiroki, to Olympus Optical Co., Ltd. Tape recorder having interlocked tape speed and tone control adjustment. 4,325,094, Cl. 360-137.000.
Ida, Shuichiro: *See—*
Oshima, Syoiti; and Ida, Shuichiro, 4,324,152, Cl. 74-606.00R.
Ideal Toy Corporation: *See—*
Cooper, Julius, 4,324,065, Cl. 46-120.000.
Iglitzki, Claude: *See—*
Goldfarb, Charles; and Iglitzki, Claude, 4,324,352, Cl. 223-91.000.
Ignasiak, Michael J., to Zimmer, Inc. Packaging for surgical implements. 4,324,331, Cl. 206-363.000.
Ignatko, Gyorgy; Ilyes, Zoltan; Nemeth, Ferenc; Racz, Matyas; Varga, Albert; and Varro, Jeno, to Kozponti Banyaszati Fejlesztesi Intezet; and Oroszlanyi Szenbanyak. Mechanized longwall system for mining. 4,324,509, Cl. 405-299.000.
Ikai, Shigeru: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Tamura, Masanori; and Yuasa, Sakae, 4,324,877, Cl. 526-127.000.
Ikeda, Minoru: *See—*
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.
Ikeda, Nobuo; and Yoshimura, Hirofumi, to Matsushita Electric Industrial Co., Ltd. Microwave heating apparatus having magnetic coupling for driving the antenna. 4,324,967, Cl. 219-10.55F.
Ikezaki, Muneyoshi: *See—*
Umino, Norihide; Ohishi, Tokuro; Ikezaki, Muneyoshi; Sato, Masanori; and Nagao, Taku, 4,324,800, Cl. 424-308.000.
Ikuta, Sunao: *See—*
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, 4,324,784, Cl. 424-130.000.
Illinois Tool Works Inc.: *See—*
Olsen, Robert C., 4,324,085, Cl. 53-48.000.
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Imazeki, Shuji: *See—*
Imahori, Seiichi; Kaneko, Masaharu; Ono, Hitoshi; Imazeki, Shuji; Mukoh, Akio; and Morishita, Hirosada, 4,324,455, Cl. 350-349.000.
Imperial Chemical Industries Limited: *See—*
Ballard, Denis G.; Charnah, Richard M.; Droughton, John F.; and Rideal, Graham R., 4,324,838, Cl. 428-402.000.
Cartwright, David, 4,324,627, Cl. 204-158.0HA.
Hartshorn, Angus J.; and Jones, Eric, 4,324,691, Cl. 252-429.00B.
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,324,182, Cl. 102-217.000.
Senior, Peter J.; Wright, Leonard F.; and Alderson, Barry, 4,324,907, Cl. 560-185.000.
Ina, Toshikazu; and Kawai, Hisasi, to Nippon Soken, Inc. Electronically controlled ignition for internal combustion engines. 4,324,217, Cl. 123-417.000.
Inada, Masami; Hashimoto, Nobuyuki; and Satomoto, Atsushi, to Aisin Seiki Kabushiki Kaisha. Temperature responsive switch. 4,325,047, Cl. 337-370.000.
Ingersoll-Rand Company: *See—*
Brown, Arthur E., 4,324,538, Cl. 418-191.000.
Ingouf, Pierre. Devices for setting a sail. 4,324,192, Cl. 114-106.000.
Inheed Pty Ltd.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,324,334, Cl. 209-459.000.
Inland Manufacturing Company: *See—*
Chausse, Leon C., 4,324,393, Cl. 269-46.000.
Innovative Computer Products: *See—*
Stutz, William H., Jr.; and Sandor, Joseph, 4,324,014, Cl. 15-4.000.
Ino, Hidetoshi: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, 4,325,114, Cl. 363-68.000.
Inoue, Hidehiko: *See—*
Ishihara, Takeo; Inoue, Hidehiko; Kishizawa, Yuji; and Hayashi, Tsutomu, 4,324,306, Cl. 180-228.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,324,969, Cl. 219-69.00C.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Electrical discharge machining system with optical isolation of a gap monitor from remote control circuit. 4,324,969, Cl. 219-69.00C.
Inoue, Tokuji: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Tamura, Masanori; and Yuasa, Sakae, 4,324,877, Cl. 526-127.000.
Inouye, Shigeharu: *See—*
Iwamatsu, Katsuyoshi; Tsuruoka, Takashi; Mizutani, Kazuko; Kawaharajyo, Katsumi; Watanabe, Tadahiro; and Inouye, Shigeharu, 4,324,891, Cl. 544-021.000.
Inouye, Yoshinori; and Ohkubo, Tadahiko, to Toray Industries, Inc. Yarn winding apparatus. 4,324,368, Cl. 242-18.0PW.
Institut Francais du Petrole: *See—*
Cosyns, Jean; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, 4,324,938, Cl. 585-332.000.
Torck, Bernard; Convers, Alaio; Duee, Didier; and Mikitenko, Paul, 4,324,924, Cl. 568-697.000.
Institut National de la Sante et de la Recherche Medicale: *See—*
Hirel, Jean C.; Goupy, Francois M.; Bloch, Pierre G.; and Degoulet, Patrice E., 4,324,663, Cl. 210-646.000.
Institute Francais du Petrole: *See—*
Le Page, Jean-Francois; Cosyns, Jean; Miquel, Jean; and Juguin, Bernard, 4,324,646, Cl. 208-71.000.
Intel Corporation: *See—*
Colley, Stephen R.; Cox, George W.; Rattner, Justin R.; and Swanson, Roger C., 4,325,120, Cl. 364-200.000.
International Business Machines Corporation: *See—*
Corcoran, Richard A.; Keenan, William A.; Michaelides, Demetrios; and Yun, Bob H., 4,325,025, Cl. 324-158.00R.
Kranz, Roger H.; de Araujo Pinheiro, Edwin J.; and Tuttle, James A., 4,325,116, Cl. 364-200.000.
International Flavor & Fragrances Inc.: *See—*
Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., 4,324,912, Cl. 564-188.000.
International Flavors & Fragrances Inc.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,324,923, Cl. 568-659.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,324,704, Cl. 252-522.00R.

International Harvester Company: *See*—
MacKenzie, Hugh J., 4,324,411, Cl. 280-43.230.
Rudy, Douglas W., 4,324,151, Cl. 74-532.000.
Schenk, Dale C.; and Van Hooydonk, Anton H. G., 4,324,296, Cl. 172-311.000.
International Resources Company, Ltd.: *See*—
Hasegawa, Shoichi; Yamashita, Thoru; and Kameda, Mitsuo, 4,324,764, Cl. 422-159.000.
International Standard Electric Corporation: *See*—
Colardelle, Joel S.; Girard, Pierre; and Pillou, Jean-Pierre M., 4,325,055, Cl. 340-347.0AD.
Irish, John T., to J. I. Industries, Incorporated. Carrier for pneumatic tube systems. 4,324,511, Cl. 406-189.000.
Ironite Products Company: *See*—
Fox, Irwin, 4,324,298, Cl. 175-64.000.
Irwin, William J.: *See*—
Range, Kenneth; Irwin, William J.; Reed, Russell, Jr.; and Silver, Wallace E., 4,324,599, Cl. 149-39.000.
Isenhoff, Eric H., to Roof Systems, Inc. Batten seaming machine. 4,324,031, Cl. 29-243.580.
Ishibe, Nobuyuki: *See*—
Pryor, Alvetta; and Ishibe, Nobuyuki, 4,324,928, Cl. 570-118.000.
Ishida, Kinji, to Yosnida Kogyo K.K. Dual window assembly. 4,324,071, Cl. 49-63.000.
Ishida, Noboru: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,324,933, Cl. 585-6.600.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.
Ishihara, Takeo; Inoue, Hidehiko; Kishizawa, Yuji; and Hayashi, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Engine supporting structure for motorcycle. 4,324,306, Cl. 180-228.000.
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, to Shin-Etsu Chemical Co., Ltd. 1-Halo-4-decene compounds. 4,324,931, Cl. 570-189.000.
Ishii, Kaoru, to Texas Instruments Incorporated. Magnetic head transducer having enhanced signal output and manufacturing method therefor. 4,325,093, Cl. 360-120.000.
Ishii, Yoshiaki: *See*—
Ito, Kanichi; Hirayama, Yoshio; Ishii, Yoshiaki; and Ando, Naoyoshi, 4,324,620, Cl. 202-89.000.
Ishikawa, Ryuichi: *See*—
Aoki, Shinji; Ishikawa, Ryuichi; and Sawada, Yasuhiro, 4,324,759, Cl. 422-62.000.
Ishikawa, Youhei: *See*—
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Ito, Kanichi; Hirayama, Yoshio; Ishii, Yoshiaki; and Ando, Naoyoshi, to Ebara Corporation. Pyrolyzing apparatus. 4,324,620, Cl. 202-89.000.
Ito, Katsuo; and Yoshimura, Kazunori, to Murata Manufacturing Coi, Ltd. Provisional fixing structure of electronic tuner. 4,325,103, Cl. 361-424.000.
Ito, Motoya: *See*—
Sato, Masaki; Okuda, Hironori; Ito, Motoya; and Makino, Yuji, 4,324,993, Cl. 310-58.000.
Ito, Satoru; Watanabe, Tadashi; and Sugiura, Shinji, to Kansai Paint Co., Ltd. Metallic painting. 4,324,708, Cl. 524-599.000.
Ito, Yoichiro, to United States of America, Health, Education and Welfare. Apparatus and method for continuous countercurrent extraction and particle separation. 4,324,661, Cl. 210-635.000.
Ito, Yoji: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,325,035, Cl. 331-96.000.
ITT Industries, Inc.: *See*—
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Lupertz, Hans-Henning, 4,324,271, Cl. 137-493.000.
Prohaska, Hans; and Seitter, Wolf, 4,325,007, Cl. 315-200.00A.
Ivy, John B.; and Boozalis, Ted S., to Dow Chemical Company, The. Halogenated hydrocarbons inhibited against denickelification with lower alkylcyanide compounds. 4,324,757, Cl. 422-7.000.
Iwamatsu, Katsuyoshi; Tsuruoka, Takashi; Mizutani, Kazuko; Kawaharajyo, Katsumi; Watanabe, Tadahiro; and Inouye, Shigeharu, to Meiji Seika Kaisha, Ltd. Process for the production of a 7-methoxycephalosporine derivative. 4,324,891, Cl. 544-021.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Hydraulic control system of automatic power transmission. 4,324,154, Cl. 74-869.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Method and apparatus for hydraulic control of automatic transmission. 4,324,156, Cl. 74-869.000.
Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Temperature sensor. 4,324,137, Cl. 73-362.0CP.
J. I. Industries, Incorporated: *See*—
Irish, John T., 4,324,511, Cl. 406-189.000.
J. M. Voith GmbH: *See*—
Bartmann, Bernhard, 4,324,369, Cl. 242-66.000.
J. S. Staedtler, Firma: *See*—
Rosel, Hans-Dieter, 4,325,072, Cl. 346-140.00R.
Jaber, Mark J.: *See*—
Seymour, Donald E.; Seymour, Greg A.; and Jaber, Mark J., 4,324,578, Cl. 71-67.000.
Jabs, Gert: *See*—
Dahm, Manfred; Jabs, Gert; and Wegner, Christian, 4,324,817, Cl. 427-150.000.
Reischl, Artur; and Jabs, Gert, 4,324,716, Cl. 524-761.000.
Jacob, Philippe; and Tondeur, Daniel, to ELF France. Process for the separation or purification of mixtures by the use of a solid adsorption. 4,324,566, Cl. 55-28.000.
Jacobi, Haireddin: *See*—
Boltze, Karl-Heinz; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,324,787, Cl. 424-250.000.
Jacobs, Harold R.; and Udell, Kent S., to University of Utah. Process for recovering products from oil shale. 4,324,292, Cl. 166-261.000.
Jacobson, Avram A. Automatic flood control valve. 4,324,268, Cl. 137-312.000.
Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, to L'Oreal. Copolymers, process for preparing the same and cosmetic compositions containing the same. 4,324,780, Cl. 424-47.000.
James B. Lansing Sound, Inc.: *See*—
Durbin, Howard M., 4,324,312, Cl. 181-171.000.
Janak, Miloslav; Ginsberg, Martin; and Reiners, Albrecht, to U.S. Philips Corporation. Device for synchronizing a clock pulse generator with a serial data signal. 4,325,090, Cl. 360-51.000.
Japan Iron and Steel Federation: *See*—
Aoki, Shinji; Ishikawa, Ryuichi; and Sawada, Yasuhiro, 4,324,759, Cl. 422-62.000.
Japan Styrene Paper Corporation: *See*—
Hatakeyama, Hideo; and Yamamoto, Toru, 4,324,748, Cl. 264-51.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Furuichi, Minoru; Honma, Chikara; and Ando, Noriaki, 4,324,866, Cl. 521-140.000.
Jarman, Davis R.; and Hinson, Virgil H. Auto body clamp. 4,324,125, Cl. 72-479.000.
Jarman, James C. Incense burning apparatus. 4,324,763, Cl. 422-116.000.
Jaye, Richard C. Sensor for detecting deleterious conditions. 4,325,059, Cl. 340-585.000.
Jeck, Richard K. Automatic control unit for a wind-following rotor. 4,325,014, Cl. 318-614.000.
Jellison, Frank R.: *See*—
Alexander, Joseph H.; and Jellison, Frank R., 4,324,604, Cl. 156-131.000.
Jenny, Ernst: *See*—
Berchtold, Max; and Jenny, Ernst, 4,324,526, Cl. 415-48.000.
Jepson, William D.: *See*—
Fradenburgh, Evan A.; Jepson, William D.; and Moffitt, Robert C., 4,324,530, Cl. 416-228.000.
Jersey Nuclear-AVCO Isotopes, Inc.: *See*—
Morton, Richard G., 4,325,006, Cl. 315-112.000.
Jessen, Leofwin A.: *See*—
Conn, James F.; and Jessen, Leofwin A., 4,324,772, Cl. 423-309.000.
Jimmy's Radio & Televison Corp.: *See*—
Hills, Joseph F., 4,325,069, Cl. 343-750.000.
Jiruse, Jaroslav; and Svobodova, Antonin, to Adamovske Strojirny, Narodni Podnik. Drive device. 4,324,180, Cl. 101-216.000.
Joelson, Ronald. Slingshot-like tether toy. 4,324,220, Cl. 124-18.000.
Joerns Furniture Company: *See*—
Houlberg, Don M.; Anderson, Larry D.; and Damico, Frank M., 4,324,010, Cl. 5-68.000.
Johansson, Nils L.; and Weiertz, Stig H. A., to AB Volvo. Gear shift not requiring adjustment. 4,324,149, Cl. 74-473.00R.
Johansson, Sixten A. M., to Volvo BM AB. Vehicle with bogie-mounted wheels and raising device for a pair of wheels. 4,324,417, Cl. 280-678.000.
John H. Best & Sons, Inc.: *See*—
Ovitz, Ernest, III, 4,324,379, Cl. 248-222.100.
Johnson, Alfred L., Jr., to LaJet Energy Company. Space frame. 4,324,083, Cl. 52-650.000.
Johnson, Allen S., Jr. Bag-type filter apparatus with air diffuser having extended bag support. 4,324,571, Cl. 55-302.000.
Johnson, Arnold N.: *See*—
Rim, Yong S.; Nudenberg, Walter; and Johnson, Arnold N., 4,324,870, Cl. 525-127.000.
Johnson, Delmar R., to Bell & Howell Company. Microfilm filing system. 4,324,484, Cl. 355-5.000.
Johnson, E. Marshall, to Rockhill Enterprises. Method and apparatus for growing hydrozoa. 4,324,200, Cl. 119-2.000.
Johnson, Frederick O., to Westinghouse Electric Corp. Regulated DC power supply. 4,325,115, Cl. 363-81.000.
Johnson & Johnson: *See*—
Beede, Charles H.; and Zirnite, Richard N., 4,324,591, Cl. 106-85.000.
Mesek, Frederick K.; and Repke, Virginia L., 4,324,245, Cl. 128-287.000.
Johnson, Logan; Wood, Grant; and Brofft, Jerry, to Minnetonka, Inc. Dispenser for dispensing liquid from a replaceable container. 4,324,348, Cl. 222-181.000.
Johnson Matthey Public Limited Company: *See*—
Heffer, John P., 4,324,700, Cl. 252-472.000.
Johnson, Nicky M.; and Blaser, Lawrence M., to Fairchild Camera & Instrument Corp. Ignition control system with electronic advance. 4,324,216, Cl. 123-415.000.

Johnston, Edwin S.: *See*—
Woodliff, Ronald D.; Paape, Kenneth L.; and Johnston, Edwin S., 4,324,424, Cl. 285-158.000.
Johnston, Tony. Throat guard. 4,324,003, Cl. 2-2.000.
Johnstone, Alexander, to BP Chemicals Limited. Polymerization catalyst and process. 4,324,692, Cl. 252-429.00B.
Jones, Allan P.; and Reichstein, Patrick L. Safety knife holder. 4,324,377, Cl. 248-37.600.
Jones, Eric: *See*—
Hartshorn, Angus J.; and Jones, Eric, 4,324,691, Cl. 252-429.00B.
Jones, Henry B.; and Smith, Randlow, to Texaco Inc. Gasification apparatus with means for cooling and separating solids from the product gas. 4,324,563, Cl. 48-62.00R.
Jonsereds Aktiebolag: *See*—
Carlsson, Kurt I., 4,324,134, Cl. 73-117.100.
Josemans, Leo J. M., to Stackpole Components Company. Slide switch. 4,324,957, Cl. 200-16.00C.
Josten, Walter; and Vahlensieck, Hans-Joachim, to Dynamit Noble Aktiengesellschaft. Tetravalent vanadium compounds which are soluble in organic solvents. 4,324,736, Cl. 260-429.00R.
Juguin, Bernard: *See*—
Cosyns, Jean; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, 4,324,938, Cl. 585-332.000.
Le Page, Jean-Francois; Cosyns, Jean; Miquel, Jean; and Juguin, Bernard, 4,324,646, Cl. 208-71.000.
Junino, Alex: *See*—
Bugaut, Andree; and Junino, Alex, 4,324,553, Cl. 8-407.000.
Jupe, Christoph; Waldmann, Helmut; and Seifert, Hermann, to Bayer Aktiengesellschaft. Process for the preparation of polyhydric phenols. 4,324,925, Cl. 568-719.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Kuwabara, Tsuneo, 4,325,036, Cl. 331-176.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Aruga, Taketo; Morita, Koichi; Hoashi, Kenzo; and Kojima, Yasuo, 4,324,098, Cl. 60-420.000.
Kabushiki Kaisha L.P.L: *See*—
Miyazaki, Kiyoshi, 4,324,477, Cl. 354-293.000.
Kabushiki Kaisha Miyano Tekkosho: *See*—
Uehara, Sukehiro, 4,324,162, Cl. 82-2.500.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Yamaguchi, Terumoto; and Ohta, Masaya, 4,324,391, Cl. 266-200.000.
Kaesz, Herbert D.: *See*—
Porter, Clifford R.; and Kaesz, Herbert D., 4,324,559, Cl. 44-1.0SR.
Kagi, Hiromichi: *See*—
Akasaki, Isamu; Ohsima, Masaaki; Matsuda, Nobuhide; Matsuki, Michio; Tsukamoto, Yoshio; Kagi, Hiromichi; and Fukazawa, Hidehalu, 4,325,070, Cl. 346-108.000.
Kahan, Frederick M.: *See*—
Graham, Donald W.; Rogers, Edward F.; and Kahan, Frederick M., 4,324,733, Cl. 260-402.500.
Kahara, Toshiki: *See*—
Ebato, Noboru; Kahara, Toshiki; and Tamura, Kohki, 4,324,828, Cl. 429-209.000.
Kahng, Dawon: *See*—
Chang, Chuan C.; Cooper, James A., Jr.; Kahng, Dawon; and Murarka, Shyam P., 4,324,038, Cl. 29-571.000.
Kajiwara, Shoichiro: *See*—
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, 4,324,784, Cl. 424-130.000.
Kalender, Willi; Linke, Gerhard; and Pfeiler, Manfred, to Siemens Aktiengesellschaft. Tomographic x-ray apparatus for the production of transverse layer images. 4,324,978, Cl. 250-445.00T.
Kalt, Evelyne: *See*—
Avar, Lajos; Finck, Hans-Werner; and Kalt, Evelyne, 4,324,628, Cl. 204-159.240.
Kameda, Mitsuo: *See*—
Hasegawa, Shoichi; Yamashita, Thoru; and Kameda, Mitsuo, 4,324,764, Cl. 422-159.000.
Kamino, Kimiyaki; and Fukuda, Masakatsu, to Mitsubishi Seiko Kabushiki Kaisha. Magnetic alloy. 4,324,597, Cl. 148-103.000.
Kamiya, Takashi; Teraji, Tsutomu; Hemmi, Keiji; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. 7-(N-Substituted-2-phenylglycinamido)-3-substituted-3-cephem-4-carboxylic acid compounds. 4,324,892, Cl. 544-28.000.
Kampf, Wolfgang: *See*—
Hahn, Karl; and Kampf, Wolfgang, 4,324,939, Cl. 585-438.000.
Kan, Takayoshi, to Research Foundation for Microbial Diseases of Osaka University. Preparation of live attenuated mumps virus for a vaccine. 4,324,861, Cl. 435-237.000.
Kaneko, Masaharu: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ono, Hitoshi; Imazeki, Shuji; Mukoh, Akio; and Morishita, Hirosada, 4,324,455, Cl. 350-349.000.
Kaneko, Masaru: *See*—
Hashimoto, Hiroshi; Kaneko, Masaru; and Kuge, Yoshihiro, 4,324,304, Cl. 180-9.520.
Kaneko, Yutaka: *See*—
Kawakatsu, Satoshi; Hirabayashi, Shigeto; Ninomiya, Hidetaka; and Kaneko, Yutaka, 4,324,856, Cl. 430-566.000.
Kansai Paint Co., Ltd.: *See*—
Ito, Satoru; Watanabe, Tadashi; and Sugiura, Shinji, 4,324,708, Cl. 524-599.000.
Karasudani, Yasuo, to Tokico Ltd. Dust cover. 4,324,318, Cl. 188-73.310.
Karayannis, Nicholas M.; and Skryantz, John S., to Standard Oil Company (Indiana). Alpha-olefin polymerization catalyst. 4,324,690, Cl. 252-429.00B.
Karl Mengele & Sohne Maschinenfabrik and Eisengiesserei GmbH & Co.: *See*—
Wistuba, Eberhard; Lenzer, Xaver; and Mandle, Herbert, 4,324,091, Cl. 56-16.600.
Karns, Phil J., to Carrier Corporation. Level supply air temperature multi-zone heat pump system and method. 4,324,288, Cl. 165-22.000.
Kashigi, Kazuo; and Kouyama, Toshitake, to Nippon Electric Co., Ltd. Digital television video signal storage system. 4,325,075, Cl. 358-13.000.
Kasper, Dennis L., to President and Fellows of Harvard College. Type II group B *Streptococci polysaccharide*. 4,324,887, Cl. 536-53.000.
Kasprzak, Kenneth A., to Dow Corning Corporation. Method for removing tacky adhesives and articles adhered therewith. 4,324,595, Cl. 134-38.000.
Kasting, Edward W.; Glasson, Richard E.; and Primus, Roy J., to Cummins Engine Company, Inc. Lubrication fluid filtering and cooling assembly. 4,324,213, Cl. 123-196.00A.
Katayama, Yoshitaka: *See*—
Takemura, Yasuo; and Katayama, Yoshitaka, 4,324,988, Cl. 307-221.00D.
Katz, Saul N., to General Foods Corporation. Adsorption decaffeination. 4,324,840, Cl. 426-422.000.
Kaufman, John G. Container for dispensing liquid. 4,324,349, Cl. 222-207.000.
Kaufmann, Jochen; Altenschopfer, Theodor; Schumann, Klaus; and Rings, Friedel, to Henkel Kommanditgesellschaft auf Aktien. Stable dishwashing agent compositions containing active chlorine. 4,324,677, Cl. 252-99.000.
Kaun, Thomas D.; and Chilenskas, Albert A., to United States of America, Energy. Negative electrode composition. 4,324,846, Cl. 429-112.000.
Kawabata, Toshimi: *See*—
Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, 4,324,598, Cl. 148-111.000.
Kawaharajyo, Katsumi: *See*—
Iwamatsu, Katsuyoshi; Tsuruoka, Takashi; Mizutani, Kazuko; Kawaharajyo, Katsumi; Watanabe, Tadahiro; and Inouye, Shigeharu, 4,324,891, Cl. 544-021.000.
Kawai, Hisasi: *See*—
Ina, Toshikazu; and Kawai, Hisasi, 4,324,217, Cl. 123-417.000.
Kawakatsu, Satoshi; Hirabayashi, Shigeto; Ninomiya, Hidetaka; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,324,856, Cl. 430-566.000.
Kawamata, Etsuo: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Kuroda, Nobuyuki; and Miyoshi, Mitsuji, 4,324,876, Cl. 526-124.000.
Kawamoto, Tamio, to Nissan Motor Co., Ltd. Mechanism for preventing misselection of reverse gear. 4,324,150, Cl. 74-476.000.
Kaye, Gordon E.: *See*—
Bartunek, William; Kaye, Gordon E.; and Mallory, Henry R., 4,325,106, Cl. 362-157.000.
Keen, Christopher V., to Dunlop Limited. Cellular intumescent materials. 4,324,835, Cl. 521-54.000.
Keenan, William A.: *See*—
Corcoran, Richard A.; Keenan, William A.; Michaelides, Demetrios; and Yun, Bob H., 4,325,025, Cl. 324-158.00R.
Kemner, Ulrich, to Robert Bosch GmbH. Noise damping device. 4,324,276, Cl. 138-30.000.
Kennecott Corporation: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,324,367, Cl. 241-60.000.
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, to Societe Chimique des Charbonnages-CdF CHIMIE. Process for shaping solid polybut-1-ene and the resulting shaped articles. 4,324,756, Cl. 264-322.000.
Kerby, Robert C., to Cominco Ltd. Method and apparatus for controlling the quality of electrolytes. 4,324,621, Cl. 204-1.00T.
Kern, Edward W., Jr.: *See*—
Buczynski, Neal J.; and Kern, Edward W., Jr., 4,324,444, Cl. 308-201.000.
Kerr, Donald L.; and Russo, Gary M., to Eastman Kodak Company. Imagewise accelerating equilibration in ultrasonographic recording. 4,324,849, Cl. 430-3.000.
Kerr, Leslie I. Microphone holder attachment and switch control therefor. 4,325,143, Cl. 455-89.000.
Kessinger, Orville E.: *See*—
Balzer, David J.; and Kessinger, Orville E., 4,324,303, Cl. 180-9.500.
Kessler, John O., to University of Arizona Foundation, The. Algal cell harvesting. 4,324,067, Cl. 47-1.400.
Keyes, David G.: *See*—
White, Dwain M.; and Keyes, David G., 4,324,883, Cl. 528-207.000.
White, Dwain M.; and Keyes, David G., 4,324,884, Cl. 528-207.000.
White, Dwain M.; and Keyes, David G., 4,324,885, Cl. 528-207.000.
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., to Design + Process Engineering Inc. Discharge assembly for an oven. 4,324,326, Cl. 198-461.000.
Kienitz, Lutz: *See*—
Wedemeyer, Karlfried; and Kienitz, Lutz, 4,324,913, Cl. 564-410.000.

Kikuchi, Hiroshi: *See*—
Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, 4,324,629, Cl. 204-180.00P.

Kim, Albert A.: *See*—
Konstantinov, Igor I.; Kormushechkina, Antonina I.; Avdonin, Jury A.; Kotlyarsky, Vladimir M.; Kim, Albert A.; Obraztsov, Nikolai V.; and Efimov, Alexei V., 4,324,667, Cl. 210-729.000.

Kim, Bang M., to General Electric Company. Mid-temperature H_2S removal process. 4,324,776, Cl. 423-550.000.

Kim, Myung K.; and Lugay, Joaquin C., to General Foods Corporation. Simulated adipose tissue. 4,324,807, Cl. 426-104.000.

Kim, Syng N.: *See*—
Sarrafian, Vahram K.; and Kim, Syng N., 4,324,403, Cl. 273-127.00R.

Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, to Nippon Steel Corporation. Finish annealing process for grain-oriented electrical steel strip or sheet. 4,324,598, Cl. 148-111.000.

Kimpel, Rolf-Dieter, to Siemens Aktiengesellschaft. Polarized magnet system. 4,325,043, Cl. 335-229.000.

Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, to Nippon Oil Co., Ltd. Electrical insulating oil compositions. 4,324,933, Cl. 585-6.600.

King Instrument Corporation: *See*—
Neathery, David O.; and Riggs, Edward J., 4,325,092, Cl. 360-119.000.

Kirbabas, Nicholas: *See*—
Schwob, Charles J.; Kirbabas, Nicholas; and Erin, Tim, 4,324,117, Cl. 68-205.00R.

Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, to Imperial Chemical Industries Limited. Apparatus and method for selectively activating plural electrical loads at predetermined relative times. 4,324,182, Cl. 102-217.000.

Kircher, Morton S.; and Specht, Steven J., to Olin Corporation. Remotely connecting and disconnecting cells from circuit. 4,324,634, Cl. 204-228.000.

Kirwan, David F.; and Naumec, John R., to United Technologies Corp. Energy beam drilling apparatus having optical fiber link position sensor. 4,324,973, Cl. 219-121.0EA.

Kishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, to Futaba Denshi Kogyo K.K. Driving circuit for a fluorescent display apparatus having fewer leads. 4,325,064, Cl. 340-753.000.

Kishizawa, Yuji: *See*—
Ishihara, Takeo; Inoue, Hidehiko; Kishizawa, Yuji; and Hayashi, Tsutomu, 4,324,306, Cl. 180-228.000.

Kita, Ryuji; Komai, Hisataka; Wakabayashi, Makoto; and Takagishi, Haruyoshi, to Nippon Zeon Co. Ltd.; and Nisson Motor Co. Ltd. Two-package solventless rust preventive material. 4,324,713, Cl. 523-457.000.

Kitasato Institute, The: *See*—
Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,324,728, Cl. 260-345.200.

Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Cyclohexyl phenethylether derivative. 4,324,923, Cl. 568-659.000.

Kiwala, Jacob: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,324,704, Cl. 252-522.00R.

Kjellberg, Jan E. Method of laying-out spacing sticks, and apparatus for carrying out the method. 4,324,520, Cl. 414-42.000.

Klamut, Carl J.: *See*—
Luhman, Thomas; Klamut, Carl J.; Suenaga, Masaki; and Welch, David, 4,324,842, Cl. 428-614.000.

Klancnik, Adolph V.; and Klancnik, Kenneth A., to Universal Automatic Corporation. Automatic turret lathe. 4,324,161, Cl. 82-2.00R.

Klancnik, Kenneth A.: *See*—
Klancnik, Adolph V.; and Klancnik, Kenneth A., 4,324,161, Cl. 82-2.00R.

Klaser, William A. Fence structure. 4,324,388, Cl. 256-19.000.

Kleinke, Bernard L.: *See*—
Chiappetti, Arthur B., 4,324,203, Cl. 119-51.110.

Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., to International Flavor & Fragrances Inc. Carboamidoalkyl norbornanes, organoleptic uses thereof and process for preparing same. 4,324,912, Cl. 564-188.000.

Klimczak, Anthony J., to Lear Siegler, Inc. Aircraft fuel booster pump assembly with altitude start capabilities. 4,324,569, Cl. 55-182.000.

Klinger, Max H. Labeling apparatus. 4,324,608, Cl. 156-351.000.

Klose, George J., to Mattel, Inc. Electronic baseball game. 4,324,402, Cl. 273-88.000.

Kniep, Claus: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,324,918, Cl. 564-503.000.

Knife, James E., to TRW Inc. Cartridge pump. 4,324,532, Cl. 417-360.000.

Knoblauch, Jack R.: *See*—
Beukema, Duane M.; and Knoblauch, Jack R., 4,324,382, Cl. 248-406.000.

Knudsen, Randall C.: *See*—
Anderson, Richard D.; Harvey, Ronald B.; Knudsen, Randall C.; and Wedel, John A., 4,324,488, Cl. 355-74.000.

Kobale, Manfred; Lorenz, Hans P.; Weingand, Kaspar; and Wengert, Rolf, to Siemens Aktiengesellschaft. Luminescent screen for flat image display devices. 4,325,002, Cl. 313-485.000.

Kobayashi, Kazuhiko: *See*—
Nanasawa, Yoshifumi; and Kobayashi, Kazuhiko, 4,324,970, Cl. 219-69.00W.

Kobayashi, Seishichi; Mori, Tatsuo; and Morofuji, Akihiko, to Toyo Seikan Kaisha Ltd. Metal can paint providing coating retaining high adhesion even with lapse of time. 4,324,822, Cl. 428-35.000.

Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Gate controlling circuit for a thyristor converter. 4,325,114, Cl. 363-68.000.

Kobayashi, Yasuhiro; and Takeda, Renzo, to Hitachi, Ltd Construction of nuclear reactor core. 4,324,615, Cl. 376-267.000.

Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing mono, bis or tris(3,3,3-trifluoropropyl)benzene. 4,324,929, Cl. 570-127.000.

Koch, Manfred; Mildenberger, Hilmar; and Sachse, Burkhard, to Hoechst Aktiengesellschaft. Fungicidal thioglycolic acid anilides, processes for their manufacture and pesticidal compositions containing them. 4,324,799, Cl. 424-301.000.

Koch, Robert C.: *See*—
Davis, James A.; and Koch, Robert C., 4,324,710, Cl. 524-76.000.

Koerner, Steve J. Trailer light connection system. 4,325,052, Cl. 340-67.000.

Kohno, Yoshiki: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,324,933, Cl. 585-6.600.

Koito Seisakusho Co. Ltd.: *See*—
Schaer, Glenn R., 4,324,623, Cl. 204-15.000.

Koizumi, Takashi: *See*—
Fukushima, Osamu; Akisada, Masahide; and Koizumi, Takashi, 4,324,478, Cl. 354-312.000.

Kojima, Yasuo: *See*—
Aruga, Taketo; Morita, Koichi; Hoashi, Kenzo; and Kojima, Yasuo, 4,324,098, Cl. 60-420.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Yoshikazu, Ikeda, 4,325,137, Cl. 370-4.000.

Komai, Hisataka: *See*—
Kita, Ryuji; Komai, Hisataka; Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,324,713, Cl. 523-457.000.

Komatsu, Yasuhiro: *See*—
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,324,916, Cl. 564-462.000.

Komura, Tsuneo: *See*—
Noguchi, Masaru; Oosaka, Shigenori; and Komura, Tsuneo, 4,324,452, Cl. 350-6.700.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kawakatsu, Satoshi; Hirabayashi, Shigeto; Ninomiya, Hidetaka; and Kaneko, Yutaka, 4,324,856, Cl. 430-566.000.
Shiozawa, Kazuo, 4,324,467, Cl. 354-38.000.

Kono, Yasuaki; and Arai, Hisaharu, to Aisan Kogyo Kabushiki Kaisha. Device for automatically regulating a choke valve in a carburetor for an internal combustion engine. 4,324,745, Cl. 261-39.00E.

Konstantinov, Igor I.; Kormushechkina, Antonina I.; Avdonin, Jury A.; Kotlyarsky, Vladimir M.; Kim, Albert A.; Obraztsov, Nikolai V.; and Efimov, Alexei V. Process for purification of waste waters from aromatic amines. 4,324,667, Cl. 210-729.000.

Koopmann, Juergen: *See*—
Mross, Wolf D.; Titzenthaler, Eckart; Koopmann, Juergen; Vogt, Volker; and Schwarzmann, Matthias, 4,324,699, Cl. 252-463.000.

Kormushechkina, Antonina I.: *See*—
Konstantinov, Igor I.; Kormushechkina, Antonina I.; Avdonin, Jury A.; Kotlyarsky, Vladimir M.; Kim, Albert A.; Obraztsov, Nikolai V.; and Efimov, Alexei V., 4,324,667, Cl. 210-729.000.

Kosche, Horst, to Ciba-Geigy Corporation. Heat-sensitive recording or copying material. 4,324,420, Cl. 282-27.500.

Koshiishi, Hiromichi: *See*—
Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, 4,324,598, Cl. 148-111.000.

Kosoczky, Ibolya: *See*—
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.
Messmer, Andras; Benko, Pal; Hajos, Gyorgy; Petocz, Lujza; Kosoczky, Ibolya; and Gorog, Peter, 4,324,786, Cl. 424-248.540.

Kothmann, Richard E., to Westinghouse Electric Corp. Variable area fuel cell cooling. 4,324,844, Cl. 429-26.000.

Kotlyarsky, Vladimir M.: *See*—
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Kunz, Paul. Rotatable pressure vessel. 4,324,344, Cl. 220-333.000.
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Langer, William J., to MTS Systems Corporation. Hydrodynamic support bearing for a belt on a tire testing machine. 4,324,128, Cl. 73-8.000.
Langley, Howard M.; and Stephens, Joseph W., to RCA Corporation. Video disc defect detector. 4,325,134, Cl. 369-58.000.
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Larson, Leigh R., to Hi-Life Rubber, Inc. Milking inflation. 4,324,201, Cl. 119-14.510.
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LaVelle, Donald R. Circular saw construction. 4,324,163, Cl. 83-855.000.
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Layer, Robert W., to B. F. Goodrich Company, The. Norbornene polymers stabilized with hindered aromatic alcohols. 4,324,717, Cl. 524-244.000.
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Le Roy, Alfred N. Illuminated wrench. 4,324,158, Cl. 81-60.000.
LeSage, George J. Jewelry case. 4,324,446, Cl. 312-245.000.
Leuthard, John E. Energy efficient water heater. 4,324,207, Cl. 122-448.00B.
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Levine, Stephen A.; Schlicht, Raymond C.; and Chafetz, Harry, to Texaco, Inc. Dispersant alkenylsuccinimides containing oxy-reduced molybdenum and lubricants containing same. 4,324,672, Cl. 252-49.700.
Levy, Nicha, to Bell Telephone Laboratories, Incorporated. Low TG soft UV-curable coatings. 4,324,575, Cl. 65-3.110.
Lewis, Paul H.; and Vartuli, James C., to Texaco Inc. Fluorided composite catalyst. 4,324,697, Cl. 252-455.00Z.
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Lim, Franklin; and Moss, Richard D., to Damon Corporation. Encapsulation of labile biological material. 4,324,683, Cl. 252-316.000.
Lindahl, Jonas A. I., to Mo och Domsjo Aktiebolag. Process for the preparation of groundwood pulp. 4,324,612, Cl. 162-23.000.
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Benkmann, Christian, 4,324,565, Cl. 55-23.000.
Ranke, Gerhard; and Weiss, Horst, 4,324,567, Cl. 55-43.000.
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Link, Gerhard; Riedl, Josef; Frohlich, Walter; and Krumbock, Reinhard. Process for the manufacture of vinyl chloride by the thermal cracking of 1,2-dichloroethane. 4,324,932, Cl. 570-226.000.
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Lipka, Stanley H.; and Lipka, David J. Shingle stripper. 4,324,042, Cl. 30-170.000.
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Logan, Clifford K., Jr. Rotary drill bit. 4,324,300, Cl. 175-379.000.
Logan, Emanuel L. Point-of-egress control device for securing exit doors safely. 4,324,425, Cl. 292-201.000.
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Louderback, Allan L.; and Szatkowski, Paul R. Blood biochemistry control standard. 4,324,687, Cl. 252-408.000.
Lovejoy, Curtis N. Electrolytic apparatus for treating continuous strip material. 4,324,633, Cl. 204-206.000.
Lovette, Norris G., Jr.; and Ruprecht, David R., to Air Products and Chemicals, Inc. Spiral-type heat exchanger. 4,324,110, Cl. 62-381.000.
Lowndes, Michael W., to Lucas Industries Limited. Battery state of charge indicator device. 4,325,010, Cl. 318-139.000.
Lu, Chin H.; Sherony, Dominic F.; and Erhardt, Peter F., to Xerox Corporation. Positive color toners. 4,324,851, Cl. 430-106.000.
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Luhman, Thomas; Klamut, Carl J.; Suenaga, Masaki; and Welch, David, to United States of America, Energy. Superconducting wire with improved strain characteristics. 4,324,842, Cl. 428-614.000.
Lulay, Arthur; and Lynch, Charles E., to Du Pont de Nemours, E. I., and Company. Process for preparing slub yarns. 4,324,095, Cl. 57-327.000.
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Lunden, Sidney L.; and Gillingham, Larry A., to Lunden Industries, Inc. Sticker placing apparatus. 4,324,521, Cl. 414-42.000.
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Maclay, G. Jordan. Adjustable wrench. 4,324,160, Cl. 81-185.000.
MacLeod, Richard H. Rechargeable flashlight. 4,325,107, Cl. 362-183.000.
Madray, George W. Assembly for attaching a dental prosthesis to teeth. 4,324,549, Cl. 433-169.000.
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Maeda, Toru, to Mitsubishi Rayon Co., Ltd. Process and apparatus for preparation of vinyl polymers. 4,324,868, Cl. 525-54.000.
Maeder, Edward G., to National Can Corporation. Stripper assembly for bodymaker. 4,324,124, Cl. 72-345.000.
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Majer, Norbert; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of monoaroylated 1,4-diaminoanthraquinones. 4,324,732, Cl. 260-377.000.
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Major, Emery. Flow meter system. 4,325,127, Cl. 364-510.000.
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Maness, Samuel G. Dual chamber personal flotation device. 4,324,234, Cl. 128-202.140.
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Mark, Vernon H.; and Sabin, Thomas D. Reflex hammer. 4,324,261, Cl. 128-740.000.
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Martinez, Manuel M. Dispenser for automatically dispensing permanent wave tissue sheets. 4,324,345, Cl. 221-41.000.
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Rosenwinkel, Donald A.; and Disko, Harry, 4,324,063, Cl. 46-44.000.
Masson Scott Thrissell Engineering Limited: *See—*
Byrt, Graham A.; and Graves, Bernard A., 4,324,397, Cl. 271-217.000.
Master Pneumatic-Detroit, Inc.: *See—*
Thrasher, George E., Jr.; and Lombardi, David, 4,324,316, Cl. 184-29.000.
Mastrup, Frithjof N.; and Marabella, Leonard J., to Hughes Aircraft Company. Apparatus for pumping gases using a chemically reactive aerosol. 4,324,765, Cl. 422-173.000.
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Matsuda, Nobuhide: *See—*
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Matsuo, Akira: *See—*
Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, 4,324,629, Cl. 204-180.00P.
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Ikeda, Nobuo; and Yoshimura, Hirofumi, 4,324,967, Cl. 219-10.55F.
Kubota, Hirokazu, 4,324,280, Cl. 152-349.000.
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Matsuyama, Iwao; Susa, Kenzo; Satoh, Shin; and Suganuma, Tsuneo, to Hitachi, Ltd. Method for producing optical glass. 4,324,576, Cl. 65-26.000.
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Mattel, Inc.: *See—*
Klose, George J., 4,324,402, Cl. 273-88.000.
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Hara, Takanori; Yoshinaga, Makoto; Yano, Haruto; and Matumura, Noriyasu, 4,324,986, Cl. 307-10.0LS.
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Bonicel, Jean P.; Cottevielle, Christian; Maucolot, Michel; and Prigent, Madeleine, 4,324,863, Cl. 521-85.000.
Maul, John A., Sr., to DBS, Inc. Imprinter with plural selectively operating platen rollers. 4,324,181, Cl. 101-269.000.
Maurer Engineering, Inc.: *See—*
Nagel, Dave D., 4,324,299, Cl. 175-107.000.
May, Roger C.: *See—*
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McCann, Floyd E.; and Fornell, Robert M., to Unit Rig & Equipment Co. Method and apparatus for mounting a giant tire. 4,324,283, Cl. 157-1.280.
McConnell, Thomas T., to Texaco Inc. Preparation of polyalkylene polyamines. 4,324,917, Cl. 564-479.000.
McCormick, Robert M., to Du Pont de Nemours, E. I., and Company. Tow baling. 4,324,176, Cl. 100-3.000.
McCullough, Timothy J. Handpiece for meat-trimming knife. 4,324,043, Cl. 30-276.000.
McDaniel, James W., to Alumina Development Corporation. Extraction and production of alumina containing less than 0.03 percent iron oxide. 4,324,769, Cl. 423-121.000.
McDonald, Ray S.: *See—*
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McDonald, Ronald K.: *See—*
Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., 4,324,034, Cl. 29-410.000.
McFarlane, Richard B. Vehicle tire comprising pneumatic tire inserts. 4,324,279, Cl. 152-314.000.
McGivern, James F., Jr., to United Technologies Corporation. Selective removal of nickel-based braze alloy from nickel-based metals. 4,324,626, Cl. 204-146.000.
McIlwain, Irwin D.: *See—*
Halls, Lawrence M.; and McIlwain, Irwin D., 4,324,092, Cl. 56-298.000.
McKay, Dwight L.: *See—*
Roberts, John S.; Bertus, Brent J.; McKay, Dwight L.; and Mark, H. Wayne, 4,324,648, Cl. 208-114.000.
McKinnie, Bonnie G.; and Ranken, Paul F., to Ethyl Corporation. Process for the preparation of ortho-(hydrocarbylthio)-phenols. 4,324,920, Cl. 568-54.000.
McLoughlin, John; Athanasiades, Neocles; and Rotblum, Yehuda, to McLoughlin, John. Chemical injection control system for fire fighting. 4,324,294, Cl. 169-13.000.
McMackin, John B., to RCA Corporation. Regulated switching apparatus. 4,325,021, Cl. 323-351.000.
McMillion, Lundy H.: *See—*
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Mead Corporation, The: *See—*
Schwob, Charles J.; Kirbabas, Nicholas; and Erin, Tim, 4,324,117, Cl. 68-205.00R.
Meckel, Benjamin B.; and Bromley, Emily I., to Spin Physics, Inc. Magnetron sputtering of magnetic materials. 4,324,631, Cl. 204-192.00M.
Medtronic, Inc.: *See—*
Athearn, Lee F., 4,324,847, Cl. 429-181.000.
Rossing, Martin A.; and McDonald, Ray S., 4,324,252, Cl. 128-419.0PG.
Meffert Alfred; and Tesmann, Holger, to Henkel Kommanditgesellschaft auf Aktien. Preparation of 2-phenylethylene phosphonic acid. 4,324,740, Cl. 260-502.40R.
Mehl, Siegfried, to U.S. Philips Corporation. Device for providing windings on closed ring cores. 4,325,045, Cl. 336-197.000.
Meiji Seika Kaisha, Ltd.: *See—*
Iwamatsu, Katsuyoshi; Tsuruoka, Takashi; Mizutani, Kazuko; Kawaharajyo, Katsumi; Watanabe, Tadahiro; and Inouye, Shigeharu, 4,324,891, Cl. 544-021.000.
Meindl, Gerhard: *See—*
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Menzies, William R., III: *See*—
Castagnos, Leonce F., Jr.; Menzies, William R., III; and Pratt, Roy E., 4,324,688, Cl. 252-417.000.
Mercer, William R., to Sanders Associates, Inc. Loran-C signal processor. 4,325,068, Cl. 343-103.000.
Merck & Co., Inc.: *See*—
Durette, Philippe L., 4,324,900, Cl. 549-11.000.
Racciato, Joseph S., 4,324,554, Cl. 8-561.000.
Sletzinger, Meyer, 4,324,890, Cl. 544-021.000.
Merger, Franz; and Nestler, Gerhard, to BASF Aktiengesellschaft. Preparation of butyrolactones. 4,324,727, Cl. 260-343.600.
Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Comformable disposable diapers having absorbent panel with bulged side members. 4,324,245, Cl. 128-287.000.
Meshberg, Philip. Locking actuator for a dispenser. 4,324,351, Cl. 222-402.110.
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Baier, Alfred; and Pfeuffer, Alfred, 4,324,389, Cl. 266-51.000.
Messmer, Andras; Benko, Pal; Hajos, Gyorgy; Petocz, Lujza; Kosoczky, Ibolya; and Gorog, Peter, to Egyt Gyogyszervegyeszeti Gyar. Pyrido[2,3-e]-as-triazine derivatives and pharmaceutical compositions. 4,324,786, Cl. 424-248.540.
Messmer, Andras: *See*—
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Metatech Corporation: *See*—
Perlin, Alfred R., 4,324,248, Cl. 128-325.000.
Meyman, Usher. Rotary machine with a plurality of rotors having peripheral rolling contact. 4,324,537, Cl. 418-58.000.
Miale, Joseph N., to Mobil Oil Corporation. Method of preparing crystalline zeolite catalyst of high activity. 4,324,696, Cl. 252-455.00Z.
Michaelides, Demetrios: *See*—
Corcoran, Richard A.; Keenan, William A.; Michaelides, Demetrios; and Yun, Bob H., 4,325,025, Cl. 324-158.00R.
Michelet, Daniel; and Veracini, Serge, to Rhone-Poulenc Agrochimie. Process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran. 4,324,731, Cl. 260-346.220.
Michelson, Thorwald J., to Transportation Security, Inc. Lock-protecting hasp. 4,324,426, Cl. 292-281.000.
Michen, Ramon: *See*—
White, Ellis S.; Zatkoff, William C.; Light, John J.; and Michen, Ramon, 4,324,392, Cl. 266-240.000.
Midwest Research Institute: *See*—
Goodson, Louis H.; and Goodman, Alan, 4,324,858, Cl. 435-20.000.
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Mikulicz, Michael Z., to UOP Inc. Butane isomerization process. 4,324,936, Cl. 585-315.000.
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Mildenberger, Hilmar: *See*—
Koch, Manfred; Mildenberger, Hilmar; and Sachse, Burkhard, 4,324,799, Cl. 424-301.000.
Miller Brewing Company: *See*—
Goldstein, Henry; Fly, Walter; Ting, Patrick; and Chicoye, Etzer, 4,324,810, Cl. 426-600.000.
Miller, Clement P.: *See*—
Spurlin, Stephen F.; Lentz, Carl A.; and Miller, Clement P., 4,324,320, Cl. 188-271.000.
Miller, Glen E., to Boeing Company, The. Light transmission load control system. 4,324,981, Cl. 250-551.000.
Miller, Robert S.: *See*—
Cordes, William F., III; Goodman, Donald; and Miller, Robert S., 4,324,874, Cl. 526-84.000.
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Carlson, Robert C., 4,324,679, Cl. 252-182.000.
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Rothlauf, Alan P., 4,325,147, Cl. 370-91.000.
Minnetonka, Inc.: *See*—
Johnson, Logan; Wood, Grant; and Brofft, Jerry, 4,324,348, Cl. 222-181.000.
Miquel, Jean: *See*—
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Mishkin, Abraham R.: *See*—
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Mitani Electronics Industry Corp.: *See*—
Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Tochikiyo; Hashimoto, Otokuma; and Mori, Hideki, 4,324,815, Cl. 427-96.000.
Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Tochikiyo; Hashimoto, Otokuma; and Mori, Hideki, to Mitani Electronics Industry Corp. Screen-printing mask and method. 4,324,815, Cl. 427-96.000.
Mitchell, Michael I.: *See*—
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,324,182, Cl. 102-217.000.
Mitchell, William O.; and Ellington, Gordon H., to Oxford Industries, Inc. Garment bagging system. 4,324,087, Cl. 53-241.000.
Mitsubishi Chemical Industries Limited: *See*—
Imahori, Seiichi; Kaneko, Masaharu; Ono, Hitoshi; Imazeki, Shuji; Mukoh, Akio; and Morishita, Hirosada, 4,324,455, Cl. 350-349.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Aoki, Shin-Ichi; and Takeya, Yasushi, 4,324,960, Cl. 200-144.00B.
Sunohara, Mineo; Okubo, Yasuhiko; Taketa, Mitsugu; Nakai, Yoshiyuki; and Miyazaki, Yukio, 4,325,096, Cl. 361-45.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, 4,324,784, Cl. 424-130.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hashimoto, Hiroshi; Kaneko, Masaru; and Kuge, Yoshihiro, 4,324,304, Cl. 180-9.520.
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Mitsubishi Seiko Kabushiki Kaisha: *See*—
Kamino, Kimiyaki; and Fukuda, Masakatsu, 4,324,597, Cl. 148-103.000.
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Mitton, David. Passive wheel lock for bicycles and the like. 4,324,119, Cl. 70-233.000.
Mitzel, Wilhelm; and Bernardi, Herbert, to G A O Gesellschaft fur Automation and Organisation mbH. Device for separating record carrying items. 4,324,394, Cl. 271-5.000.
Miyake, Masayoshi, to Sumitomo Electric Industries, Ltd. Self-bonding magnet wire. 4,324,837, Cl. 428-375.000.
Miyano, Masateru; and Dorn, Clifford R., to G. D. Searle & Co. 7-[5-Oxo-3-hydroxy-2-(3-substituted)-3-hydroxypropyl)-1-cyclopentene]-heptanoic acids and derivatives thereof. 4,324,902, Cl. 560-53.000.
Miyata, Yasuji; and Hirose, Kazuhiko, to Tokico, Ltd. Turbine flowmeter. 4,324,144, Cl. 73-861.770.
Miyazaki, Kiyoshi, to Kabushiki Kaisha L.P.L. Photographic tripod apparatus. 4,324,477, Cl. 354-293.000.
Miyazaki, Tochikiyo: *See*—
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Mizusawa Kagaku Kozyo Kabushiki Kaisha: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; Mori, Takashi; and Honma, Toshio, 4,324,768, Cl. 423-92.000.
Mizutani, Kazuko: *See*—
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Mo och Domsjo Aktiebolag: *See*—
Lindahl, Jonas A. I., 4,324,612, Cl. 162-23.000.
Mobil Oil Corporation: *See*—
Angevine, Philip J.; and Stein, Thomas R., 4,324,645, Cl. 208-50.000.
Dessau, Ralph M., 4,324,940, Cl. 585-466.000.
Hungerford, Gordon P., 4,324,707, Cl. 524-173.000.
Miale, Joseph N., 4,324,696, Cl. 252-455.00Z.
Rollmann, Louis D.; and Walsh, Dennis E., 4,324,651, Cl. 208-309.000.
Moffitt, Robert C.: *See*—
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Molnach, Michael G.; and Harbison, William H., to Anderson Company of Indiana, The. Windshield wiper connecting pin adaptor. 4,324,019, Cl. 15-250.320.

Mohri, Akio: *See—*
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.
Mohri, Katsuo: *See—*
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Molgaard, Aage, to Danfoss A/S. Thermostat attachment for a radiator valve. 4,324,196, Cl. 116-277.000.
Moller, Jens L., to Continental Group, Inc., The. Folded tab. 4,324,343, Cl. 220-270.000.
Molnar, Frank J.: *See—*
Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., 4,324,034, Cl. 29-410.000.
Monsanto Company: *See—*
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Monte, Charles; and Carter, Barry E. Tone changing means for percussion instruments. 4,324,164, Cl. 84-1.040.
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Parrini, Paolo; Ciaccia, Vittorio; Corrieri, Guglielmo; and Righi, Gian P., 4,324,831, Cl. 428-288.000.
Moody, Edward, to Electric Power Research Institute, Inc. Flow distribution system for coolant in a nuclear reactor and method. 4,324,614, Cl. 376-175.000.
Mookherjee, Braja D.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,324,704, Cl. 252-522.00R.
Moon, Suhdok D.; and Trackman, Marshall H., to Qume Corporation. Means to inhibit paper feed during carriage or print wheel movement. 4,324,500, Cl. 400-664.000.
Moore, L. Frank; and Price, George M., to Frymaster Corporation, The. Filter system for frying apparatus. 4,324,173, Cl. 99-330.000.
Moore, Robert L. Wood handling machine. 4,324,519, Cl. 414-28.000.
Moos, Kurt; and Buschor, Karl, to GEMA AG Apparatebau. Method of atomization and atomizing device for coating material using the Coanda effect. 4,324,361, Cl. 239-3.000.
Moranne, Jean-Pierre, to Societe Anonyme des Usines Chausson. Heat exchanger comprising a core of tubes engaged inside end plates mechanically connected with header boxes. 4,324,290, Cl. 165-173.000.
Moraw, Roland; Steinau, Peter; and Pierson, Fritz, to Hoechst Aktiengesellschaft. Identity card with incorporated fibrids. 4,324,421, Cl. 283-7.000.
Moreau, Rene J.: *See—*
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Morehouse, James E.; and Pedersen, Richard A., to Bell Telephone Laboratories, Incorporated. Detector circuit for thyristors. 4,325,099, Cl. 361-93.000.
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Mori, Hideki: *See—*
Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Tochikiyo; Hashimoto, Otokuma; and Mori, Hideki, 4,324,815, Cl. 427-96.000.
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Morikawa, Teruo, to Canon Kabushiki Kaisha. Developing device. 4,324,199, Cl. 118-658.000.
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Moris, Alfred H., to Minnesota Mining and Manufacturing Company. Magnetic marker for locating a splice within magnetic tape. 4,325,087, Cl. 360-13.000.
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Moroff, Helmut; Boessler, Hanns; Hauser, Hans; and Ladisich, Gerhard, to Rohm GmbH. Method of impregnating web structures with a synthetic resin. 4,324,832, Cl. 428-289.000.
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Morozowich, Walter, to Upjohn Company, The. Phenacyl-type esters of $PGF_{2\alpha}$ and its 15-methyl analogs. 4,324,905, Cl. 560-121.000.
Morris, Nathan. Sanitation system particularly for marine craft. 4,324,007, Cl. 4-321.000.
Morris, Stephen. Beverage container support. 4,324,381, Cl. 248-311.200.
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Moser, Roland: *See—*
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Clement, Donald R.; and Nikirk, Roger G., 4,324,610, Cl. 156-602.000.
Gay, Michael J., 4,324,990, Cl. 307-350.000.
Groth, Edward J., Jr., 4,325,129, Cl. 364-717.000.
Gunter, Thomas G.; and Tredennick, Harry L., 4,325,121, Cl. 364-200.000.
Ooms, William J.; and Barnett, Richard E., 4,325,031, Cl. 331-1.00A.
Motosacoche S.A.: *See—*
Curetti, Ennio G.; and Collombin, Andre M., 4,324,541, Cl. 425-562.000.
Mountain, John F. Solar heat collecting panel. 4,324,227, Cl. 126-437.000.
Mross, Wolf D.; Titzenthaler, Eckart; Koopmann, Juergen; Vogt, Volker; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Supported catalysts and their treatment for the preparation of ethylene oxide. 4,324,699, Cl. 252-463.000.
MTS Systems Corporation: *See—*
Langer, William J., 4,324,128, Cl. 73-8.000.
Mueller, Hans; Wulz, Klaus; Beyer, Karl-Heinz; and Streit, Werner, to BASF Aktiengesellschaft. Manufacture of polyalkylenepolyamines. 4,324,724, Cl. 260-239.00E.
Muetterties, Andrew J.: *See—*
Genese, Joseph N.; and Muetterties, Andrew J., 4,324,238, Cl. 128-214.00G.
Muhlau, Karl-Heinz. Balancing device for vehicle wheels etc. 4,324,139, Cl. 73-457.000.
Mukoh, Akio: *See—*
Imahori, Seiichi; Kaneko, Masaharu; Ono, Hitoshi; Imazeki, Shuji; Mukoh, Akio; and Morishita, Hirosada, 4,324,455, Cl. 350-349.000.
Mullane, William I.; and Smith, Douglas J., to Procter & Gamble Company, The. Disposable absorbent article having a stain resistant topsheet. 4,324,246, Cl. 128-287.000.
Mullins, John W. Refrigerant line service valve. 4,324,270, Cl. 137-317.000.
Mullins, Wayne L. Thermally insulative cementitious block modules and method of making same. 4,324,080, Cl. 52-309.120.
Mundschenk, David D., to R & D Systems, Inc. Hematology control composition and methods for its use. 4,324,686, Cl. 252-408.000.
Murai, Wasaburo, to Terasaki Denki Sangyo Kabushiki Kaisha. Circuit interrupter. 4,325,041, Cl. 335-35.000.
Murakami Kaimeido Co., Ltd.: *See—*
Kumai, Toshiyuki, 4,324,454, Cl. 350-289.000.
Murarka, Shyam P.: *See—*
Chang, Chuan C.; Cooper, James A., Jr.; Kahng, Dawon; and Murarka, Shyam P., 4,324,038, Cl. 29-571.000.
Murata Manufacturing Coi, Ltd.: *See—*
Ito, Katsuo; and Yoshimura, Kazunori, 4,325,103, Cl. 361-424.000.
Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,325,035, Cl. 331-96.000.
Murkowski, Rita J., to Continental Group, Inc., The. Carton with air cushion end structure. 4,324,357, Cl. 229-37.00E.
Murphy, Randall T.; and Heling, Dennis H., to Lear Siegler, Inc. Vehicle seat with individual adjustable front thigh support. 4,324,431, Cl. 297-284.000.
Muskat, Josef, to Passavant-Werke Michelbacher Hutte. Apparatus for treating wastewater with oxygen. 4,324,655, Cl. 210-96.100.
Muz, Edwin, to Weitman and Konrad GmbH & Co. KG. Device for the electrostatic application of material particles entrained in a stream of gas to an advancing, flat substrate. 4,324,198, Cl. 118-630.000.
Mwanyoha, Bakari, to NU Industries, Inc. Lamp conversion unit. 4,325,109, Cl. 362-412.000.
Nagano, Katsusuke, to Dai Nippon Insatsu Kabushiki Kaisha. Method of proof-printing in gravure printing. 4,324,179, Cl. 101-170.000.
Nagao, Taku: *See—*
Umino, Norihide; Ohishi, Tokuro; Ikezaki, Muneyoshi; Sato, Masanori; and Nagao, Taku, 4,324,800, Cl. 424-308.000.
Nagasaka, Yukio: *See—*
Tanaka, Tsugio; Hashimoto, Kohichi; and Nagasaka, Yukio, 4,324,711, Cl. 523-172.000.
Nagashima, Thuyoshi: *See—*
Fujii, Hironory; Nagashima, Thuyoshi; and Shibamoto, Nobuyori, 4,324,742, Cl. 260-505.00C.
Nagel, Dave D., to Maurer Engineering, Inc. Downhole drilling motor with pressure balanced bearing seals. 4,324,299, Cl. 175-107.000.
Nagpal, Krishen L.: *See—*
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., 4,324,926, Cl. 568-730.000.
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, to Mitsubishi Gas

Chemical Company, Inc. Process for preventing growth of marine organisms on a substance using hydrogen peroxide. 4,324,784, Cl. 424-130.000.

Naito, Hiroyuki: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; Mori, Takashi; and Honma, Toshio, 4,324,768, Cl. 423-92.000.

Nakagawa, Tomiyo. Exponential horn for use in horn-type loudspeakers. 4,324,313, Cl. 181-192.000.

Nakahara, Hiromi: *See*—
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.

Nakai, Hiromitu: *See*—
Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Nakai, Hiromitu, 4,324,850, Cl. 430-24.000.

Nakai, Yoshiyuki: *See*—
Sunohara, Mineo; Okubo, Yasuhiko; Taketa, Mitsugu; Nakai, Yoshiyuki; and Miyazaki, Yukio, 4,325,096, Cl. 361-45.000.

Nakanishi, Masakatsu: *See*—
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, 4,324,784, Cl. 424-130.000.

Nakano, Jiro: *See*—
Sugimoto, Hiroshi; Nakano, Jiro; and Yanagihara, Noritaka, 4,324,153, Cl. 74-866.000.

Nakazawa, Kunihiro, to Nippon Electric Co., Ltd. Portable radio set with a carrying holder. 4,325,142, Cl. 455-89.000.

Nalco Chemical Company: *See*—
Gebler, Kenneth A., 4,324,862, Cl. 501-109.000.

Nanasawa, Yoshifumi; and Kobayashi, Kazuhiko, to Mitsubushiki Denki Kabushiki Kaisha. Wire cut method of shaping workpiece by electric discharge. 4,324,970, Cl. 219-69.00W.

Narang, Rajendra K. Endless track. 4,324,437, Cl. 305-11.000.

Narens, Daniel S.; and Reuben, Harold, to Akro Corporation, The. Tufted pile floor covering with piling of coated fibrous material. 4,324,824, Cl. 428-92.000.

Naruo, Kyoichi: *See*—
Seto, Kunihira; and Naruo, Kyoichi, 4,324,705, Cl. 521-44.000.

National Can Corporation: *See*—
Maeder, Edward G., 4,324,124, Cl. 72-345.000.

National Distillers & Chemical Corp.: *See*—
Hinnenkamp, James A., 4,324,695, Cl. 252-437.000.
Horvitz, David; and Brima, Thomas S., 4,324,909, Cl. 560-246.000.

National Gypsum Company: *See*—
Pearson, Robert J., 4,324,079, Cl. 52-255.000.
Rutkowski, Edward J.; Mapes, Carl R.; Wing, Steven D.; and Dawdy, Jack A., 4,324,082, Cl. 52-481.000.

National Research Development Corporation: *See*—
Bewley, David K.; and Finding, Kenneth, 4,324,979, Cl. 250-505.000.
Wright, Basil M., 4,324,259, Cl. 128-722.000.

Naumann, Gerd; and Treine, Bernd, to Hermann Berstorff Maschinenbau GmbH. Microwave heating method and apparatus including adjustable tuning members. 4,324,965, Cl. 219-10.55F.

Naumec, John R.: *See*—
Kirwan, David F.; and Naumec, John R., 4,324,973, Cl. 219-121.0EA.

Near Equilibrium Research Associates: *See*—
Oliker, Michael D., 4,324,564, Cl. 55-20.000.

Neathery, David O.; and Riggs, Edward J., to King Instrument Corporation. Apparatus for detection of cue data carried by a recording medium moving at greatly varying speeds. 4,325,092, Cl. 360-119.000.

Nedelec, Lucien: *See*—
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,324,790, Cl. 424-263.000.

Neelameggham, Ramaswami: *See*—
Barlow, E. W.; and Neelameggham, Ramaswami, 4,324,771, Cl. 423-283.000.

Nemeth, Ferenc: *See*—
Ignatko, Gyorgy; Ilyes, Zoltan; Nemeth, Ferenc; Racz, Matyas; Varga, Albert; and Varro, Jeno, 4,324,509, Cl. 405-299.000.

Nesterov, Boris F.: *See*—
Redikultsev, Jury V.; Litvinenko, Leonid A.; Petrikevich, Svetlana B.; Chermenskay, Taisia S.; Vershkov, David S.; Nesterov, Boris F.; and Bogoroditskaya, Irina V., 4,324,762, Cl. 422-106.000.

Nestler, Gerhard: *See*—
Merger, Franz; and Nestler, Gerhard, 4,324,727, Cl. 260-343.600.

Newton, Richard C.; and Romanek, Gerald A., to Phillips Petroleum Company. Process for producing a fused fabric. 4,324,752, Cl. 264-25.000.

Nickels, Aubrey G., to General Electric Co. Axial-centrifugal flow impeller. 4,324,529, Cl. 416-187.000.

Niedecker, Herbert. Wrapper closed with a U-shaped clip and process and apparatus for attaching a hanger loop to the wrapper section. 4,324,086, Cl. 53-134.000.

Nikirk, Roger G.: *See*—
Clement, Donald R.; and Nikirk, Roger G., 4,324,610, Cl. 156-602.000.

Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., to American Hospital Supply Corporation. Latch mechanism for dental handpiece assembly. 4,324,548, Cl. 433-126.000.

Ninomiya, Hidetaka: *See*—
Kawakatsu, Satoshi; Hirabayashi, Shigeto; Ninomiya, Hidetaka; and Kaneko, Yutaka, 4,324,856, Cl. 430-566.000.

Ninomiya, Kenjiro: *See*—
Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Tochikiyo; Hashimoto, Otokuma; and Mori, Hideki, 4,324,815, Cl. 427-96.000.

NIPAC, Ltd.: *See*—
Dean, John J.; and Helzig, Lloyd M., 4,324,561, Cl. 44-10.00E.

Nippon Electric Co., Ltd.: *See*—
Kashigi, Kazuo; and Kouyama, Toshitake, 4,325,075, Cl. 358-13.000.
Nakazawa, Kunihiro, 4,325,142, Cl. 455-89.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takeuchi, Atsushi, 4,325,016, Cl. 318-640.000.

Nippon Kogaku K.K.: *See*—
Terunuma, Hiroshi, 4,324,470, Cl. 354-214.000.

Nippon Oil Co., Ltd.: *See*—
Kimura, Shoji; Ishida, Noboru; Masunaga, Midori; and Kohno, Yoshiki, 4,324,933, Cl. 585-6.600.
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Kuroda, Nobuyuki; and Miyoshi, Mitsuji, 4,324,876, Cl. 526-124.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Ueda, Takeo, 4,324,419, Cl. 280-804.000.

Nippon Soken, Inc.: *See*—
Hattori, Tadashi; and Ueno, Yoshiki, 4,324,218, Cl. 123-440.000.
Ina, Toshikazu; and Kawai, Hisasi, 4,324,217, Cl. 123-417.000.

Nippon Steel Corporation: *See*—
Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, 4,324,598, Cl. 148-111.000.

Nippon Zeon Co. Ltd.: *See*—
Kita, Ryuji; Komai, Hisataka; Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,324,713, Cl. 523-457.000.

Nippondenso Co., Ltd.: *See*—
Fujiwara, Kenichi; Sugi, Hikaru; and Nishikawa, Mineo, 4,324,112, Cl. 62-511.000.

Nishihama, Takamichi, to Dainippon Screen Seizo Kabushiki Kaisha. Film suction plate for a process camera. 4,324,487, Cl. 355-73.000.

Nishikawa, Masaji, to Olympus Optical Company Limited. Recording device including a heating means. 4,324,486, Cl. 355-14.0FU.

Nishikawa, Mineo: *See*—
Fujiwara, Kenichi; Sugi, Hikaru; and Nishikawa, Mineo, 4,324,112, Cl. 62-511.000.

Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Oscillator using dielectric resonator. 4,325,035, Cl. 331-96.000.

Nishizawa, Masahiro: *See*—
Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Nakai, Hiromitu, 4,324,850, Cl. 430-24.000.

Nissan Chemical Industries, Ltd.: *See*—
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.

Nissan Motor Company, Limited: *See*—
Aoyama, Syunichi, 4,324,210, Cl. 123-90.550.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,324,154, Cl. 74-869.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,324,156, Cl. 74-869.000.
Kawamoto, Tamio, 4,324,150, Cl. 74-476.000.

Nisshin Flour Milling Co. Ltd.: *See*—
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,324,916, Cl. 564-462.000.

Nisson Motor Co. Ltd.: *See*—
Kita, Ryuji; Komai, Hisataka; Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,324,713, Cl. 523-457.000.

Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; and Moriya, Kiyoshi, 4,324,586, Cl. 75-69.000.

Nix, Richard J. Saddle. 4,324,090, Cl. 54-44.000.

Noble Manufacturing Company: *See*—
Bethea, James R., 4,324,605, Cl. 156-247.000.

Noguchi, Masaru; Oosaka, Shigenori; and Komura, Tsuneo, to Fuji Photo Film Co., Ltd. Light beam scanning system with motor and vibration isolating means. 4,324,452, Cl. 350-6.700.

Nomura, Norimasa; and Yoshida, Atsushi, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic film feeder for an automatic developer. 4,324,480, Cl. 354-320.000.

Norman, Lewis R.; and Gardner, Tommy R., to Halliburton Company. Foamed high viscosity aqueous inorganic acid solutions and methods of using the same. 4,324,669, Cl. 252-8.55C.

Norman, Richard O.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., 4,324,451, Cl. 339-176.0MP.

North Pacific Products, Inc.: *See*—
Bettencourt, Pierre A.; and Cleveland, Charles H., 4,324,064, Cl. 46-81.000.

Northern Telecom Limited: *See*—
Dyment, John C.; Look, Christopher M.; and Chik, Kiu-Chi D., 4,325,034, Cl. 372-50.000.

Novo Industri A/S: *See*—
Olsen, Hans A. S., 4,324,805, Cl. 426-46.000.

NRG Research Laboratories, Inc.: *See*—
Page, Edward J.; and Rock, James E., 4,324,834, Cl. 428-312.600.

NU Industries, Inc.: *See*—
Mwanyoha, Bakari, 4,325,109, Cl. 362-412.000.

Nudenberg, Walter: *See*—
Rim, Yong S.; Nudenberg, Walter; and Johnson, Arnold N., 4,324,870, Cl. 525-127.000.

Nusslin, Hans-Jorg: *See—*
Weihrich, Georg; Grunert, Wilfried; and Nusslin, Hans-Jorg, 4,324,944, Cl. 373-105.000.

Oak Industries Inc.: *See—*
Dulen, Edwina K., 4,324,962, Cl. 200-159.00B.

Obayashi, Tsutomu; and Hiraoka, Hideyuki, to Hiraoka & Co., Ltd. Water-proof, fuse-bonding fabric. 4,324,827, Cl. 428-192.000.

Obermayer, Arthur S. Method of monitoring toxic fluids. 4,324,558, Cl. 23-232.00R.

Oborg, Lars: *See—*
Sundkvist, Per H.; and Oborg, Lars, 4,324,249, Cl. 128-360.000.

Obraztsov, Nikolai V.: *See—*
Konstantinov, Igor I.; Kormushechkina, Antonina I.; Avdonin, Jury A.; Kotlyarsky, Vladimir M.; Kim, Albert A.; Obraztsov, Nikolai V.; and Efimov, Alexei V., 4,324,667, Cl. 210-729.000.

Ocampo, Joseph D. Board game method. 4,324,406, Cl. 273-242.000.

Occidental Petroleum Corporation: *See—*
Woinsky, Samuel G., 4,324,102, Cl. 60-641.300.

Occidental Research Corporation: *See—*
Dines, Martin B., 4,324,767, Cl. 423-3.000.
Durai-Swamy, Kandaswamy, 4,324,637, Cl. 208-8.0LE.
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Durai-Swamy, Kandaswamy, 4,324,642, Cl. 208-8.0LE.
Durai-Swamy, Kandaswamy, 4,324,643, Cl. 208-8.0LE.
Durai-Swamy, Kandaswamy, 4,324,644, Cl. 208-8.0LE.

O'Connell, Philip E.; Hughes, Larry M.; and Fletcher, James D., to RCA Corporation. Video disc player having carriage drive apparatus. 4,325,136, Cl. 369-219.000.

Oda Gosen Kogyo Kabushiki Kaisha: *See—*
Shimizu, Hichio, 4,324,371, Cl. 242-153.000.

Odin, Eugene: *See—*
Demler, Walter R.; Nagpal, Krishen L.; Dollard, Richard M.; Odin, Eugene; and Donahue, Donald T., 4,324,926, Cl. 568-730.000.

Oellerer, Friedrich: *See—*
Theurer, Josef; and Oellerer, Friedrich, 4,324,186, Cl. 105-177.000.

Officine Savio S.p.A.: *See—*
Cicerone, Aurelio, 4,324,094, Cl. 57-267.000.

Ogawa, Tomoya: *See—*
Matsui, Masanao; and Ogawa, Tomoya, 4,324,895, Cl. 544-313.000.

Ogawa, Yukio; and Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetic drive device for camera. 4,324,471, Cl. 354-234.000.

Ohishi, Tokuro: *See—*
Umino, Norihide; Ohishi, Tokuro; Ikezaki, Muneyoshi; Sato, Masanori; and Nagao, Taku, 4,324,800, Cl. 424-308.000.

Ohkubo, Tadahiko: *See—*
Inouye, Yoshinori; and Ohkubo, Tadahiko, 4,324,368, Cl. 242-18.0PW.

Ohm, Aloys: *See—*
Schneeweiss, Manfred; Gotzenberger, Adolf; and Ohm, Aloys, 4,324,416, Cl. 280-661.000.

Ohsima, Masaaki: *See—*
Akasaki, Isamu; Ohsima, Masaaki; Matsuda, Nobuhide; Matsuki, Michio; Tsukamoto, Yoshio; Kagi, Hiromichi; and Fukazawa, Hidehalu, 4,325,070, Cl. 346-108.000.

Ohta, Masaya: *See—*
Yamaguchi, Terumoto; and Ohta, Masaya, 4,324,391, Cl. 266-200.000.

Ohtsuka, Kunio: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,324,154, Cl. 74-869.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,324,156, Cl. 74-869.000.

Oishi, Yasushi; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Process for developing a silver halide emulsion. 4,324,855, Cl. 430-378.000.

Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, to Hitachi, Ltd. Process for regenerating chemical copper plating solution. 4,324,629, Cl. 204-180.00P.

Okabe, Hiroshi: *See—*
Matsuzaki, Meiki; Okabe, Hiroshi; Tanaka, Seishiro; Takiguchi, Takao; and Onodera, Kunikatsu, 4,324,801, Cl. 424-311.000.

Okamoto, Toyoo: *See—*
Asakura, Kouichi; and Okamoto, Toyoo, 4,324,485, Cl. 355-8.000.

Okamoto, Yukikazu; and Tagami, Manabu, to Sumitomo Chemical Company, Limited. Pesticidal aqueous suspension. 4,324,781, Cl. 424-78.000.

Okauchi, Tetsuo; Hiraga, Kentaro; and Sato, Yasuo, to Takeda Chemical Industries, Ltd. Acaricidal agents. 4,324,795, Cl. 424-274.000.

Okubo, Yasuhiko: *See—*
Sunohara, Mineo; Okubo, Yasuhiko; Taketa, Mitsugu; Nakai, Yoshiyuki; and Miyazaki, Yukio, 4,325,096, Cl. 361-45.000.

Okuda, Hironori: *See—*
Sato, Masaki; Okuda, Hironori; Ito, Motoya; and Makino, Yuji, 4,324,993, Cl. 310-58.000.

O'Lenick, Paul D.: *See—*
Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,324,649, Cl. 208-130.000.

Oliker, Michael D., to Near Equilibrium Research Associates. Adsorption beds and method of operation thereof. 4,324,564, Cl. 55-20.000.

Olin Corporation: *See—*
Kircher, Morton S.; and Specht, Steven J., 4,324,634, Cl. 204-228.000.

Olsen, Hans A. S., to Novo Industri A/S. Method of producing soy protein hydrolysate from fat-containing soy material, and soy protein hydrolysate. 4,324,805, Cl. 426-46.000.

Olsen, Robert C., to Illinois Tool Works Inc. Carrier assembly apparatus. 4,324,085, Cl. 53-48.000.

Olson, Jerry A., to Eaton Corporation. Single path adjustable flowmeter. 4,324,143, Cl. 73-861.620.

Olsson, Sven O. Paint equipment cleaning tool. 4,324,018, Cl. 15-236.00R.

Olympus Optical Co., Ltd.: *See—*
Ichikawa, Hiroki, 4,325,094, Cl. 360-137.000.
Nishikawa, Masaji, 4,324,486, Cl. 355-14.0FU.
Sakai, Noboru; and Shimizu, Tokuo, 4,324,995, Cl. 310-153.000.
Satoh, Ken, 4,325,080, Cl. 358-127.000.
Takayama, Syuichi, 4,324,466, Cl. 354-33.000.
Terada, Katumi; and Saito, Michiharu, 4,324,472, Cl. 354-266.000.

Oman, Richard A., to Grumman Aerospace Corp. Portable wind turbine for charging batteries. 4,324,985, Cl. 290-55.000.

Omron Tateisi Electronics Co.: *See—*
Sakakino, Takahiro; and Yamada, Hiroyoshi, 4,324,956, Cl. 200-16.00R.

Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, to Kitasato Institute, The. Compound nanaomycin A and derivatives thereof and a process for producing the same. 4,324,728, Cl. 260-345.200.

O'Neill, Richard F., to General Dynamics Corporation. Heat sink/fluid-to-fluid mechanical coupling of spacecraft coolant systems. 4,324,375, Cl. 244-163.000.

Ono, Hitoshi: *See—*
Imahori, Seiichi; Kaneko, Masaharu; Ono, Hitoshi; Imazeki, Shuji; Mukoh, Akio; and Morishita, Hirosada, 4,324,455, Cl. 350-349.000.

Onodera, Kunikatsu: *See—*
Matsuzaki, Meiki; Okabe, Hiroshi; Tanaka, Seishiro; Takiguchi, Takao; and Onodera, Kunikatsu, 4,324,801, Cl. 424-311.000.

Ooms, William J.; and Barnett, Richard E., to Motorola, Inc. Divider with dual modulus prescaler for phase locked loop frequency synthesizer. 4,325,031, Cl. 331-1.00A.

Oosaka, Shigenori: *See—*
Noguchi, Masaru; Oosaka, Shigenori; and Komura, Tsuneo, 4,324,452, Cl. 350-6.700.

Opfer, John C.: *See—*
Hall, Walter J.; and Opfer, John C., 4,324,959, Cl. 200-144.0AP.

Organisation Europeenne de Recherches Spatiales: *See—*
Renner, Udo, 4,325,124, Cl. 364-459.000.

Oroszlanyi Szenbanyak: *See—*
Ignatko, Gyorgy; Ilyes, Zoltan; Nemeth, Ferenc; Racz, Matyas; Varga, Albert; and Varro, Jeno, 4,324,509, Cl. 405-299.000.

Osada, Yoshihide; and Sugioka, Syuji, to Tokyo Shibaura Electric Co., Ltd. Semiconductor switching device. 4,325,074, Cl. 357-37.000.

Oshima, Mitsuyoshi: *See—*
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, 4,324,931, Cl. 570-189.000.

Oshima, Syoiti; and Ida, Shuichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing device for a manual transmission for an automobile. 4,324,152, Cl. 74-606.00R.

Osteo AG: *See—*
Reuther, Jurgen; Moser, Heinz; and Krauss, Hermann, 4,324,550, Cl. 433-174.000.

Ota, Kiyoshi: *See—*
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.

Otis Elevator Company: *See—*
Sun, Lu; and Cilderman, Janis J., 4,324,360, Cl. 238-349.000.

Otsuka, Kenichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Counter controlled pulse width modulated inverter. 4,325,112, Cl. 363-42.000.

Ovitz, Ernest, III, to John H. Best & Sons, Inc. Display shelf lock. 4,324,379, Cl. 248-222.100.

Owens-Corning Fiberglas Corporation: *See—*
Poulsen, Peder U., 4,324,982, Cl. 250-560.000.
Williamson, Michael, 4,324,942, Cl. 373-39.000.
Yau, Ben J., 4,324,833, Cl. 428-290.000.

Oxford, Alexander W.: *See—*
Bradshaw, John; Oxford, Alexander W.; and Scopes, David I. C., 4,324,792, Cl. 424-267.000.

Oxford Industries, Inc.: *See—*
Mitchell, William O.; and Ellington, Gordon H., 4,324,087, Cl. 53-241.000.

Oy E. Sarlin AB: *See—*
Sarvanne, Hannu, 4,324,531, Cl. 417-360.000.

Oy Wartsila AB: *See—*
Samuel, Olof; and Hellemaa, Heikki, 4,324,212, Cl. 123-179.00F.

Paape, Kenneth L.: *See—*
Woodliff, Ronald D.; Paape, Kenneth L.; and Johnston, Edwin S., 4,324,424, Cl. 285-158.000.

Pacesetter Systems, Inc.: *See—*
Mann, Brian M., 4,324,251, Cl. 128-419.0PT.

Packaging Corporation of America: *See—*
Champlin, Charles L., 4,324,328, Cl. 206-194.000.

Paddock, Paul F.: *See—*
Conway, Tim D.; and Paddock, Paul F., 4,324,335, Cl. 209-586.000.

Page, Edward J.; and Rock, James E., to NRG Research Laboratories, Inc. Insulation means and method. 4,324,834, Cl. 428-312.600.

Pako Corporation: *See*—
Anderson, Richard D.; Harvey, Ronald B.; Knudsen, Randall C.; and Wedel, John A., 4,324,488, Cl. 355-74.000.

Pallmar, Anders B.: *See*—
Sarebjork, Karl W. H.; and Pallmar, Anders B., 4,324,735, Cl. 260-425.000.

Palloch, Herbert; and Erndt, Hans, to Frankl & Kirchner GmbH & Co. KG, Fabrik fur Elektromotoren u. elektrische Apparate. Circuit board with plug connector. 4,324,448, Cl. 339-17.00C.

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Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.

Palomer, Enrique P. Process for generating movement and energy on the basis of the flotation of bodies. 4,324,099, Cl. 60-497.000.

Papantoniou, Christos: *See*—
Jacquet, Bernard; Mahieu, Claude; and Papantoniou, Christos, 4,324,780, Cl. 424-47.000.

Paratte, Daniel, to Fabrique d'Horlogerie de Fontainemelon. Electromagnetic motor. 4,324,992, Cl. 310-49.00R.

Parfitt, Ronald H. Instrument assembly. 4,324,197, Cl. 116-300.000.

Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., to Pullman Incorporated. Fired process heater. 4,324,649, Cl. 208-130.000.

Park, David B.: *See*—
Khoylian, Rouzas R.; Cowdery, James R.; and Park, David B., 4,324,326, Cl. 198-461.000.

Parks, Bennett A.; and Parks, Stephen I. Method and apparatus for event rate prospecting and application to wind prospecting. 4,325,122, Cl. 364-420.000.

Parks, Edward G.; and Troncale, August J., Jr., to United States of America, Navy. Anti-slosh baffle compartment assembly. 4,324,272, Cl. 137-574.000.

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Parks, Bennett A.; and Parks, Stephen I., 4,325,122, Cl. 364-420.000.

Parmet, Arthur A.; and Dawson, Charles W., to Honeywell Information Systems Inc. Apparatus for calculating a check digit for a stream of data read from a document. 4,325,117, Cl. 364-200.000.

Parrini, Paolo; Ciaccia, Vittorio; Corrieri, Guglielmo; and Righi, Gian P., to Montedison S.p.A. Formed structures based on synthetic fibers and having soundproofing properties. 4,324,831, Cl. 428-288.000.

Passavant-Werke Michelbacher Hutte: *See*—
Muskat, Josef, 4,324,655, Cl. 210-96.100.

Patel, Naren I., to Siecor Corporation. Filling materials for electrical and light waveguide communications cables. 4,324,453, Cl. 350-96.230.

Patel, Natvarlal K.; and Plaisted, Anthony C., to Celtite, Inc. Cartridge containing fast acting inorganic adhesive systems, grouting compositions and method of use. 4,324,592, Cl. 106-85.000.

Patton, John T., Jr.; and Rupert, John P., to BASF Wyandotte Corporation. Process for the preparation of molded polyurethane-polyurea elastomers and molded parts prepared thereby. 4,324,867, Cl. 521-159.000.

Patton, Tad L., to Exxon Research & Engineering Co. Polymers characterized by 1,3-imidazolidine-1,3-diyl rings plasticized with aromatic nitriles. 4,324,836, Cl. 428-336.000.

Peabody Process Systems, Inc.: *See*—
Bakke, Even, 4,324,770, Cl. 423-242.000.

Pearson, Laurence B., to Pearson's Inc. Panel mounting arrangement for squeeze chutes. 4,324,206, Cl. 119-99.000.

Pearson, Robert J., to National Gypsum Company. Cornerbead and corner clip. 4,324,079, Cl. 52-255.000.

Pearson's Inc.: *See*—
Pearson, Laurence B., 4,324,206, Cl. 119-99.000.

Peck, Paul L. Arrow rest for archery bow. 4,324,221, Cl. 124-24.00R.

Pedain, Josef: *See*—
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, 4,324,879, Cl. 528-45.000.

Pedersen, Richard A.: *See*—
Morehouse, James E.; and Pedersen, Richard A., 4,325,099, Cl. 361-93.000.

Pelletier, James A., to Bell Telephone Laboratories, Incorporated. Cable shield fault location using a capacitive-inductive coupler. 4,325,022, Cl. 324-52.000.

Pennwalt Corporation: *See*—
Sandler, Stanley R.; and Chen, Mabel M., 4,324,910, Cl. 564-60.000.

Perego, Guiseppe. Collapsible perambulator cot frame structure including telescopic side members. 4,324,410, Cl. 280-42.000.

Perlin, Alfred R., to Metatech Corporation. Microsurgical clip. 4,324,248, Cl. 128-325.000.

Perron, Robert: *See*—
Gauthier-Lafaye, Jean; and Perron, Robert, 4,324,927, Cl. 568-902.000.

Perry Oceanographics, Inc.: *See*—
Cunningham, Frank D.; Witt, Michael A.; and Hill, Robert M., 4,324,195, Cl. 114-312.000.

Peschau, Gerhard: *See*—
Pforr, Gerhard; Peschau, Gerhard; Schippmann, Guenter; Appl, Max; Voelkl, Erfried; and Stark, Hans, 4,324,570, Cl. 55-267.000.

Peterson, Donovan F. Pulse width modulation control circuit. 4,325,011, Cl. 318-345.00B.

Petocz, Lujza: *See*—
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.
Messmer, Andras; Benko, Pal; Hajos, Gyorgy; Petocz, Lujza; Kosoczky, Ibolya; and Gorog, Peter, 4,324,786, Cl. 424-248.540.

Petrikevich, Svetlana B.: *See*—
Redikultsev, Jury V.; Litvinenko, Leonid A.; Petrikevich, Svetlana B.; Chermenskay, Taisia S.; Vershkov, David S.; Nesterov, Boris F.; and Bogoroditskaya, Irina V., 4,324,762, Cl. 422-106.000.

Peyton, Ralph B. Speed indicator for fishing gear. 4,324,135, Cl. 73-187.000.

Peyton, Richard H.; and Thornton, Donald I., to Fram Corporation. Fluid filter. 4,324,660, Cl. 210-440.000.

Pfeiler, Manfred: *See*—
Kalender, Willi; Linke, Gerhard; and Pfeiler, Manfred, 4,324,978, Cl. 250-445.00T.

Pfeuffer, Alfred: *See*—
Baier, Alfred; and Pfeuffer, Alfred, 4,324,389, Cl. 266-51.000.

Pfitzner, Jorg: *See*—
Dhein, Rolf; Reuter, Knud; Rudolph, Hans; and Pfitzner, Jorg, 4,324,880, Cl. 528-80.000.

Pforr, Gerhard; Peschau, Gerhard; Schippmann, Guenter; Appl, Max; Voelkl, Erfried; and Stark, Hans, to BASF Aktiengesellschaft. Apparatus for de-dusting gases. 4,324,570, Cl. 55-267.000.

Philargo: *See*—
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,324,579, Cl. 71-74.000.

Phillips Petroleum Company: *See*—
Borst, Roger L., 4,324,555, Cl. 23-230.0EP.
Drake, Charles A.; and Turk, Stanley D., 4,324,738, Cl. 260-465.00H.
Edmonds, James T., Jr.; and Scoggins, Lacey E., 4,324,886, Cl. 528-387.000.
Gardner, Lloyd E., 4,324,647, Cl. 208-111.000.
Newton, Richard C.; and Romanek, Gerald A., 4,324,752, Cl. 264-25.000.
Roberts, John S.; Bertus, Brent J.; McKay, Dwight L.; and Mark, H. Wayne, 4,324,648, Cl. 208-114.000.

Pickenhagen, Wilhelm; and Velluz, Alain, to Firmenich SA. Flavoring with α,β-unsaturated aldehydes. 4,324,809, Cl. 426-534.000.

Pickles, Robert A., to Texaco, Inc. Locking mechanism for telescopic tubing. 4,324,502, Cl. 403-104.000.

Pierson, Fritz: *See*—
Moraw, Roland; Steinau, Peter; and Pierson, Fritz, 4,324,421, Cl. 283-7.000.

Piesik, Edward T., to General Dynamics, Pomona Division. Flexible area launch tube rear cover. 4,324,167, Cl. 89-1.800.

Pifferi, Giorgio: *See*—
Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, 4,324,788, Cl. 424-250.000.

Pillou, Jean-Pierre M.: *See*—
Colardelle, Joel S.; Girard, Pierre; and Pillou, Jean-Pierre M., 4,325,055, Cl. 340-347.0AD.

Pinza, Mario: *See*—
Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, 4,324,788, Cl. 424-250.000.

Pipe, William J. C.; and Gray, John B. Method of and apparatus for cooling blocks of hot porous material. 4,324,107, Cl. 62-268.000.

Pirzadeh, Brian: *See*—
DeVita, Joseph; and Pirzadeh, Brian, 4,325,118, Cl. 364-200.000.

Pitesky, Isadore. Tubular fitment. 4,324,423, Cl. 285-156.000.

Pitney Bowes Inc.: *See*—
Albright, David B.; and Conti, Joseph A., 4,324,396, Cl. 271-125.000.
Tomlie, Robert J., Jr., 4,325,113, Cl. 363-60.000.

Plaisted, Anthony C.: *See*—
Patel, Natvarlal K.; and Plaisted, Anthony C., 4,324,592, Cl. 106-85.000.

Plantation Patterns, Inc.: *See*—
Saiger, Herbert C., 4,324,433, Cl. 297-442.000.

Poad, William J.: *See*—
Dembicki, Michael T.; and Poad, William J., 4,324,601, Cl. 156-69.000.

Pocket Supportable Atomizer Device Trust: *See*—
Stansbury, Benjamin H., Jr., 4,324,362, Cl. 239-211.000.

Poiget, Gilbert: *See*—
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,324,579, Cl. 71-74.000.

Polaroid Corporation: *See*—
Berger, Michael, 4,324,853, Cl. 430-245.000.
Coughlan, Edward H., 4,324,473, Cl. 354-276.000.

Polychrome Corporation: *See*—
Huang, Jen-chi, 4,324,841, Cl. 428-457.000.

Pommer, Ernst-Heinrich: *See*—
Hagen, Helmut; Reuther, Wolfgang; and Pommer, Ernst-Heinrich, 4,324,793, Cl. 424-270.000.

Porter Chadburn Limited: *See*—
Porter, Harold, 4,324,333, Cl. 206-526.000.

Porter, Clifford R.; and Kaesz, Herbert D. Method for the removal of sulfur from carbonaceous material. 4,324,559, Cl. 44-1.0SR.

Porter, Harold, to Porter Chadburn Limited. Transportation of fluent material. 4,324,333, Cl. 206-526.000.

Poulsen, Peder U., to Owens-Corning Fiberglas Corporation. Pipe wall thickness monitoring apparatus. 4,324,982, Cl. 250-560.000.

PPG Industries, Inc.: *See*—
Zibritosky, George, 4,324,373, Cl. 244-121.000.

Prahauser, Georg; Schmidlin, Robert; and Trede, Wolfgang, to Buck Chemisch-Technische Werke GmbH & Co. Smoke projectile charge. 4,324,183, Cl. 102-334.000.

Pratt, Charles E., to Chattem, Inc. Process for making a mixed oxyaluminum acylate composition useful in grease manufacture. 4,324,670, Cl. 252-37.700.

Pratt, Roy L.: *See*—
Castagnos, Leonce F., Jr.; Menzies, William R., III; and Pratt, Roy E., 4,324,688, Cl. 252-417.000.

President and Fellows of Harvard College: *See*—
Kasper, Dennis L., 4,324,887, Cl. 536-53.000.

Prete, Ernest, Jr., to Ancra Corporation. Ratchet buckle having reinforcement strengthening means. 4,324,022, Cl. 24-68.0CD.

Prete, Ernest, Jr., to Ancra Corporation. Ratchet buckle having reinforcing spreader bar insert. 4,324,023, Cl. 24-68.0CD.

Prewo, Karl M.: *See*—
Brennan, John J.; and Prewo, Karl M., 4,324,843, Cl. 428-697.000.

Price, George M.: *See*—
Moore, L. Frank; and Price, George M., 4,324,173, Cl. 99-330.000.

Priepke, Edward H.; and Martenas, Wayne B., to Sperry Corporation. Apparatus for declutching a gear selector. 4,324,324, Cl. 192-101.000.

Prigent, Madeleine: *See*—
Bonicel, Jean P.; Cottevielle, Christian; Maucolot, Michel; and Prigent, Madeleine, 4,324,863, Cl. 521-85.000.

Primus, Roy J.: *See*—
Kasting, Edward W.; Glasson, Richard E.; and Primus, Roy J., 4,324,213, Cl. 123-196.00A.

Procter & Gamble Company, The: *See*—
Aziz, Mohammed I., 4,324,247, Cl. 128-287.000.
Mullane, William I.; and Smith, Douglas J., 4,324,246, Cl. 128-287.000.

Product Design & Development, Inc.: *See*—
Sterner, Maurice E., Jr., 4,324,072, Cl. 49-129.000.

Product Dynamics, Ltd.: *See*—
Kruger, Frederick W., Jr.; and Bosch, Warren E., 4,324,405, Cl. 273-238.000.

Prohaska, Hans; and Seitter, Wolf, to ITT Industries, Inc. Hazard warning circuit. 4,325,007, Cl. 315-200.00A.

Proud, Joseph M.; Riseberg, Leslie A.; and Fallier, Charles N., Jr., to GTE Laboratories Incorporated. Method and apparatus for starting high intensity discharge lamps. 4,325,004, Cl. 315-45.000.

Provesta Corporation: *See*—
Vanderveen, John W.; and Malick, Emil A., 4,324,527, Cl. 415-213.00B.

Pryor, Alvetta; and Ishibe, Nobuyuki, to Dow Chemical Company, The. Stabilized methylchloroform formulation containing cyclopropyl methyl carbinol. 4,324,928, Cl. 570-118.000.

Pryor, Harry H.; and Schinker, James J., to UMC Industries, Inc. Drink dispensing. 4,324,494, Cl. 366-156.000.

Puderbaugh, George, to Diemolding Corporation. Volumetric spirometer. 4,324,260, Cl. 128-728.000.

Pullman Incorporated: *See*—
Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,324,649, Cl. 208-130.000.
Roldness, David J., 4,324,189, Cl. 105-378.000.

Purdie, Anthony F., to Barr & Stroud Limited. Laser component. 4,324,475, Cl. 356-352.000.

Purtell, Jack L.; and Purtell, Rufus J. Floating water detector. 4,325,060, Cl. 340-604.000.

Purtell, Rufus J.: *See*—
Purtell, Jack L.; and Purtell, Rufus J., 4,325,060, Cl. 340-604.000.

Quanta Chemical Ltd.: *See*—
Reilly, Frank, 4,324,036, Cl. 29-437.000.

Quintini, Massimo: *See*—
Biaggi, Roberto; and Quintini, Massimo, 4,324,878, Cl. 526-200.000.

Quiogue, Virgilio, to Burroughs Corporation. Switched mode regulated DC to DC converter. 4,325,111, Cl. 363-17.000.

Quiroz, Gabriella. Solar panel, particularly for facades of buildings. 4,324,232, Cl. 126-450.000.

Qume Corporation: *See*—
Moon, Suhdok D.; and Trackman, Marshall H., 4,324,500, Cl. 400-664.000.
Steinhardt, Maxwell, 4,324,498, Cl. 400-144.200.

R. A. Hanson Co., Inc.: *See*—
Hanson, Richard W., 4,324,539, Cl. 425-59.000.

R & D Systems, Inc.: *See*—
Mundschenk, David D., 4,324,686, Cl. 252-408.000.

Rabinovitch, Yosef K., to Edward L. Bateman Limited. Walking machines. 4,324,302, Cl. 180-8.00C.

Racciato, Joseph S., to Merck & Co., Inc. Use of TKP as an antimigrant. 4,324,554, Cl. 8-561.000.

Racz, Matyas: *See*—
Ignatko, Gyorgy; Ilyes, Zoltan; Nemeth, Ferenc; Racz, Matyas; Varga, Albert; and Varro, Jeno, 4,324,509, Cl. 405-299.000.

Radiometer A/S: *See*—
Vesterager, Peter K. R., 4,324,256, Cl. 128-635.000.

Rai, Raghuvir, to Telautograph Corporation. Thermal recording stylus. 4,325,071, Cl. 346-139.00C.

Rains, John K.; and Reimert, Larry E., to Vetco Offshore, Inc. Low torque pack-off seal assembly with retrievable lower section. 4,324,422, Cl. 285-140.000.

Rains, Lyle V.: *See*—
Stubben, David R.; and Rains, Lyle V., 4,324,401, Cl. 273-85.00G.

Ranck, Dan E.: *See*—
Gibbs, Dale S.; Sinacola, James F.; and Ranck, Dan E., 4,324,714, Cl. 524-113.000.

Range, Kenneth; Irwin, William J.; Reed, Russell, Jr.; and Silver, Wallace E., to United States of America, Navy. Gelled slurry explosive. 4,324,599, Cl. 149-39.000.

Ranke, Gerhard; and Weiss, Horst, to Linde Aktiengesellschaft. Separation of gaseous components from a gaseous mixture by physical scrubbing. 4,324,567, Cl. 55-43.000.

Ranken, Paul F.: *See*—
McKinnie, Bonnie G.; and Ranken, Paul F., 4,324,920, Cl. 568-54.000.

Ransburg Corporation: *See*—
Bentley, Stanley L., 4,324,812, Cl. 427-8.000.

Rapp, Erich: *See*—
Eistetter, Klaus; and Rapp, Erich, 4,324,796, Cl. 424-278.000.

Rappinger, Bo: *See*—
Stenkvist, Sven-Einar; and Rappinger, Bo, 4,324,943, Cl. 373-72.000.

Rask, Richard O.: *See*—
Hagen, Magnus F.; and Rask, Richard O., 4,324,439, Cl. 308-3.800.

Rathbone, Elner B., to Talres Development (N.A.) N.V. Process for the preparation of chlorodeoxysugars. 4,324,888, Cl. 536-122.000.

Rattner, Justin R.: *See*—
Colley, Stephen R.; Cox, George W.; Rattner, Justin R.; and Swanson, Roger C., 4,325,120, Cl. 364-200.000.

Rauen, John T., Jr., to C-D Marketing Ltd. Headlamp washer assembly having a multiported flow valve. 4,324,363, Cl. 239-284.00A.

Ravagnani, Frederick J.; and Schonfeld, Steven E., to Firestone Tire & Rubber Company, The. Method, composition and product employing a tetracarboxylic dianhydride to improve adhesion between a metal member and a contiguous rubber skim stock. 4,324,281, Cl. 152-359.000.

Ray, George C., III, to General Foods Corporation. Selective tamper resistance for on-package peelable premiums. 4,324,823, Cl. 428-43.000.

RCA Corporation: *See*—
Harwood, Leopold A.; and Wittmann, Erwin J., 4,325,076, Cl. 358-31.000.
Langley, Howard M.; and Stephens, Joseph W., 4,325,134, Cl. 369-58.000.
McMackin, John B., 4,325,021, Cl. 323-351.000.
O'Connell, Philip E.; Hughes, Larry M.; and Fletcher, James D., 4,325,136, Cl. 369-219.000.
Reichert, Walter F., 4,324,814, Cl. 427-86.000.
Schade, Otto H., Jr., 4,325,017, Cl. 323-313.000.
Schade, Otto H., Jr., 4,325,018, Cl. 323-313.000.
Whitley, George J., 4,325,040, Cl. 334-17.000.
Williams, Richard, 4,324,132, Cl. 73-61.300.

Reale, Michael J., to Stauffer Chemical Company. Polyurethane foams having low discoloration. 4,324,865, Cl. 521-107.000.

Redactron Corporation: *See*—
Herman, Morton B., 4,325,063, Cl. 340-750.000.

Rederiaktiebolaget Nordstjernan: *See*—
Samuel, Olof; and Hellemaa, Heikki, 4,324,212, Cl. 123-179.00F.

Redikultsev, Jury V.; Litvinenko, Leonid A.; Petrikevich, Svetlana B.; Chermenskay, Taisia S.; Vershkov, David S.; Nesterov, Boris F.; and Bogoroditskaya, Irina V. Apparatus for sterilization by steam of fermentation objects. 4,324,762, Cl. 422-106.000.

Redstone, Reuben: *See*—
Hughes, Brian T.; Redstone, Reuben; Vokes, John C.; and Wight, David R., 4,325,073, Cl. 357-22.000.

Reed, Russell, Jr.: *See*—
Range, Kenneth; Irwin, William J.; Reed, Russell, Jr.; and Silver, Wallace E., 4,324,599, Cl. 149-39.000.

Rees, Robert L. Tax calculator. 4,324,975, Cl. 235-70.00A.

Reese, William J., to Lobo, Alfred D., a part interest. Hypodermic syringe operable with double-looped ring. 4,324,241, Cl. 128-218.0PA.

Rehm, Stephen J.; and Lee, Young R., to Combustion Engineering, Inc. De-emulsifier. 4,324,734, Cl. 260-403.000.

Reichelderfer, Richard F.: *See*—
Vogel, Diane C.; Tang, Marian C.; and Reichelderfer, Richard F., 4,324,611, Cl. 156-643.000.

Reichert, Walter F., to RCA Corporation. Method for forming a narrow thin film line. 4,324,814, Cl. 427-86.000.

Reichhold Limited: *See*—
Sudan, Krishan K.; and Berchem, Antoine, 4,324,747, Cl. 264-13.000.

Reichstein, Patrick L.: *See*—
Jones, Allan P.; and Reichstein, Patrick L., 4,324,377, Cl. 248-37.600.

Reilly, Frank, to Quanta Chemical Ltd. "Method of making orthodontic screw-type device". 4,324,036, Cl. 29-437.000.

Reimert, Larry E.: *See*—
Rains, John K.; and Reimert, Larry E., 4,324,422, Cl. 285-140.000.

Reinecke, Erich, to WABCO Fahrzeugbremsen GmbH. Automatic load-dependent braking-force control device. 4,324,436, Cl. 303-22.00R.

Reiners, Albrecht: *See*—
Janak, Miloslav; Ginsberg, Martin; and Reiners, Albrecht, 4,325,090, Cl. 360-51.000.

Reinert, Charles P., to Solarein, Inc. Solar collector panels having coated fibrous filling for fire inhibition. 4,324,231, Cl. 126-449.000.

Reinhard, Fred J.: *See*—
Bankes, Kristen E.; Large, Donald M.; Reinhard, Fred J.; and Tamashasky, Joseph A., 4,324,600, Cl. 156-64.000.

Reischl, Artur; and Jabs, Gert, to Bayer Aktiengesellschaft. Solutions of polyisocyanate polyaddition products. 4,324,716, Cl. 524-761.000.
Reitmayer, Gustav. Disc player apparatus. 4,325,133, Cl. 369-263.000.
Reliable Electric Company: *See—*
Baumbach, Bertram W., 4,325,100, Cl. 361-119.000.
Renner, Udo, to Organisation Europeenne de Recherches Spatiales. System for controlling the direction of the momentum vector of a geosynchronous satellite. 4,325,124, Cl. 364-459.000.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; and Repke, Virginia L., 4,324,245, Cl. 128-287.000.
Research Foundation for Microbial Diseases of Osaka University: *See—*
Kan, Takayoshi, 4,324,861, Cl. 435-237.000.
Research Triangle Institute: *See—*
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,324,794, Cl. 424-273.00B.
Resovszki, Gabor: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth nee Zalantai, Livia, 4,324,903, Cl. 560-82.000.
Reuben, Harold: *See—*
Narens, Daniel S.; and Reuben, Harold, 4,324,824, Cl. 428-92.000.
Reutel, Ernst: *See—*
Elsner, Georg; Vollmer, Hartfrid; and Reutel, Ernst, 4,324,919, Cl. 568-8.000.
Reuter, Knud: *See—*
Dhein, Rolf; Reuter, Knud; Rudolph, Hans; and Pfitzner, Jorg, 4,324,880, Cl. 528-80.000.
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, to BASF Aktiengesellschaft. Supported catalysts containing vanadium pentoxide, titanium dioxide, phosphorus, rubidium and/or cesium, with or without zirconium dioxide. 4,324,694, Cl. 252-435.000.
Reuther, Jurgen; Moser, Heinz; and Krauss, Hermann, to Osteo AG. Implant for the jaw. 4,324,550, Cl. 433-174.000.
Reuther, Wolfgang: *See—*
Hagen, Helmut; Reuther, Wolfgang; and Pommer, Ernst-Heinrich, 4,324,793, Cl. 424-270.000.
Rhone-Poulenc Agrochimie: *See—*
Cordier, Georges, 4,324,914, Cl. 564-412.000.
Michelet, Daniel; and Veracini, Serge, 4,324,731, Cl. 260-346.220.
Rhone-Poulenc Industries: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,324,927, Cl. 568-902.000.
Ricci, Louis N.: *See—*
Maier, Alfred E.; and Ricci, Louis N., 4,324,963, Cl. 200-318.000.
Richter, Herbert. Key ring. 4,324,121, Cl. 70-459.000.
Rickey, Robert B. Exercising device. 4,324,399, Cl. 272-144.000.
Ricoh Company, Ltd.: *See—*
Asakura, Kouichi; and Okamoto, Toyoo, 4,324,485, Cl. 355-8.000.
Tagawa, Kazuaki; Suzuki, Minoru; and Hashimoto, Makoto, 4,324,483, Cl. 355-3.0DD.
Rideal, Graham R.: *See—*
Ballard, Denis G.; Charnah, Richard M.; Droughton, John F.; and Rideal, Graham R., 4,324,838, Cl. 428-402.000.
Riech, Volker; Saupe, Wolfgang; and Sorgenicht, Dietrich, to Daystrom Limited. Calibration devices. 4,324,126, Cl. 73-1.00J.
Riedl, Josef: *See—*
Link, Gerhard; Riedl, Josef; Frohlich, Walter; and Krumbock, Reinhard, 4,324,932, Cl. 570-226.000.
Riggs, Edward J.: *See—*
Neathery, David O.; and Riggs, Edward J., 4,325,092, Cl. 360-119.000.
Righi, Gian P.: *See—*
Parrini, Paolo; Ciaccia, Vittorio; Corrieri, Guglielmo; and Righi, Gian P., 4,324,831, Cl. 428-288.000.
Rikagaku Kenkyusho: *See—*
Matsui, Masanao; and Ogawa, Tomoya, 4,324,895, Cl. 544-313.000.
Rim, Yong S.; Nudenberg, Walter; and Johnson, Arnold N., to Uniroyal, Inc. Scorch-safe acceleration of urethane vulcanization of unsaturated rubbers. 4,324,870, Cl. 525-127.000.
Rings, Friedel: *See—*
Kaufmann, Jochen; Altenschopfer, Theodor; Schumann, Klaus; and Rings, Friedel, 4,324,677, Cl. 252-99.000.
Riseberg, Leslie A.: *See—*
Proud, Joseph M.; Riseberg, Leslie A.; and Fallier, Charles N., Jr., 4,325,004, Cl. 315-45.000.
Risser, James A. Solar collector and heat and cold generator. 4,324,229, Cl. 126-439.000.
Ristuccia, Donald J.; and Cotton, John F., to Westinghouse Electric Corp. Distribution transformer having a primary disconnect switch. 4,324,961, Cl. 200-150.00R.
Roantree, Michael L.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. 1-Benzyl-5-nitro-4-(pyridyl or imidazolyl) alkylamino-1,2,3,6-tetrahydropyrimidines and blocking of histamine H_2-receptors therewith. 4,324,789, Cl. 424-251.000.
Robert Bosch GmbH: *See—*
Kemner, Ulrich, 4,324,276, Cl. 138-30.000.
Roberts, John S.; Bertus, Brent J.; McKay, Dwight L.; and Mark, H. Wayne, to Phillips Petroleum Company. Cracking catalyst poisons passivated with tin compounds plus both sulfur and phosphorus. 4,324,648, Cl. 208-114.000.
Roberts, Sidney N.: *See—*
Wright, Douglas C.; and Roberts, Sidney N., 4,324,334, Cl. 209-459.000.
Robertshaw Controls Company: *See—*
Bauer, Werner R.; and Van Fossen, Robert A., 4,324,273, Cl. 137-625.430.
Robertson, Robert F.; Connor, Thomas J.; and Rodkey, F. Lee, to United States of America, Navy. Portable COHB analyzer. 4,324,556, Cl. 23-230.00B.
Robeson, Lloyd M., to Union Carbide Corporation. Polyarylate blends with ethylene-alkyl acrylate copolymers. 4,324,869, Cl. 525-68.000.
Robinson, Harry R.: *See—*
Majicek, Stepan; and Robinson, Harry R., 4,324,372, Cl. 242-192.000.
Roch, Jacques L., to Xynetics, Inc. Universal high speed holder. 4,324,047, Cl. 33-18.00R.
Rock, James E.: *See—*
Page, Edward J.; and Rock, James E., 4,324,834, Cl. 428-312.600.
Rockhill Enterprises: *See—*
Johnson, E. Marshall, 4,324,200, Cl. 119-2.000.
Rockwell International Corporation: *See—*
Shutt, Sidney G., 4,325,033, Cl. 372-94.000.
Rodder, Fritz: *See—*
Heitlinger, Paul; and Rodder, Fritz, 4,324,546, Cl. 433-25.000.
Rodkey, F. Lee: *See—*
Robertson, Robert F.; Connor, Thomas J.; and Rodkey, F. Lee, 4,324,556, Cl. 23-230.00B.
Rodriguez, George H., to Sprague Electric Company. PTCR Package. 4,325,051, Cl. 338-220.000.
Rogers, Edward F.: *See—*
Graham, Donald W.; Rogers, Edward F.; and Kahan, Frederick M., 4,324,733, Cl. 260-402.500.
Rogers, Russell L.: *See—*
Upham, Neil R.; and Rogers, Russell L., 4,324,407, Cl. 277-27.000.
Rohde & Schwarz GmbH & Co KG: *See—*
Zirwick, Kurt, 4,325,023, Cl. 324-77.00B.
Rohm GmbH: *See—*
Moroff, Helmut; Boesaler, Hanns; Hauser, Hans; and Ladisich, Gerhard, 4,324,832, Cl. 428-289.000.
Rohrbaugh, John M.: *See—*
Stonestreet, Jimmy B.; and Rohrbaugh, John M., 4,324,202, Cl. 119-51.00R.
Roldness, David J., to Pullman Incorporated. Car end foldable doors locking device. 4,324,189, Cl. 105-378.000.
Rollmann, Louis D.; and Walsh, Dennis E., to Mobil Oil Corporation. Deasphalting process. 4,324,651, Cl. 208-309.000.
Roman, Steven A., to Shell Oil Company. Ketoenamine pyrethroid intermediates. 4,324,915, Cl. 564-454.000.
Romanek, Gerald A.: *See—*
Newton, Richard C.; and Rómanek, Gerald A., 4,324,752, Cl. 264-25.000.
Roof Systems, Inc.: *See—*
Isenhoff, Eric H., 4,324,031, Cl. 29-243.580.
Rosel, Hans-Dieter, to J. S. Staedtler, Firma. Writing device control apparatus. 4,325,072, Cl. 346-140.00R.
Rosencwaig, Allan. Liquid chromatography detector. 4,324,131, Cl. 73-61.10C.
Rosenwinkel, Donald A.; and Disko, Harry, to Marvin Glass & Associates. Toy motor vehicle. 4,324,063, Cl. 46-44.000.
Ross, Gerhard: *See—*
Dahlhausen, Gebhard; Dibbern, Hans-Werner; Fulberth; and Ross, Gerhard, 4,324,779, Cl. 424-20.000.
Ross Operating Valve Company: *See—*
Beach, Earl; and Matle, Calvin, 4,324,314, Cl. 181-230.000.
Ross, Robert R.; and Bansch, Daniel R., to H. A. Phillips & Co. Refrigeration system. 4,324,106, Cl. 62-197.000.
Ross, William D.: *See—*
Eisentraut, Kent J.; Ross, William D.; Hillan, William J.; Brooks, Joseph J.; and Duffy, Thomas G., 4,324,758, Cl. 422-61.000.
Rossbach, Horst; and Wagensonner, Eduard, to AGFA-Gevaert AG. Arrangement for adjusting components of photographic apparatus or the like. 4,324,465, Cl. 354-25.000.
Rossing, Martin A.; and McDonald, Ray S., to Medtronic, Inc. Memory control circuitry for implantable medical devices. 4,324,252, Cl. 128-419.0PG.
Rotblum, Yehuda: *See—*
McLoughlin, John; Athanasiades, Neocles; and Rotblum, Yehuda, 4,324,294, Cl. 169-13.000.
Rothenberg, Bruce J. Mounting pin. 4,324,380, Cl. 248-302.000.
Rothlauf, Alan P., to Minnesota Mining & Manufacturing Co. Asynchronous multiplex system. 4,325,147, Cl. 370-91.000.
Rouchon, Jean M.; and Lepeytre, Jean P., to Thomson-CSF. High dynamics multispectral opto-electrical receiver system. 4,325,083, Cl. 358-228.000.
Roussel Uclaf: *See—*
Guillaume, Jacques; Nedelec, Lucien; and Dumont, Claude, 4,324,790, Cl. 424-263.000.
Rouverol, William S.; and Krumme, Robert C. Rolling contact element. 4,324,441, Cl. 308-177.000.
Rovinsky, William, to Step-Lite Footwear Inc. Night light slipper. 4,324,054, Cl. 36-137.000.
Rowe, Russell L.: *See—*
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,324,367, Cl. 241-60.000.
Royal Maid, Inc.: *See—*
Herbig, Eugene O., 4,324,016, Cl. 15-119.00A.
Rubin, Charles P.: *See—*
Wittmann, Alois; and Rubin, Charles P., 4,324,374, Cl. 244-158.00R.
Rudolph, Hans: *See—*
Dhein, Rolf; Reuter, Knud; Rudolph, Hans; and Pfitzner, Jorg, 4,324,880, Cl. 528-80.000.

Rudy, Douglas W., to International Harvester Company. Four quadrant control lever restraint. 4,324,151, Cl. 74-532.000.

Rudy, Michael W.: *See*—
Kraemer, Edward J.; Therien, Robert D.; Rudy, Michael W.; Walsh, Frederick E.; Lee, Han J.; Bell, Ronald; and Horning, Thomas D., 4,324,474, Cl. 355-65.000.

Ruhrchemie Aktiengesellschaft: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,324,918, Cl. 564-503.000.

Rule, William T., to Hanna Mining Company, The. Recovery of copper from copper oxide minerals. 4,324,654, Cl. 209-166.000.

Rupert, John P.: *See*—
Patton, John T., Jr.; and Rupert, John P., 4,324,867, Cl. 521-159.000.

Ruprecht, David R.: *See*—
Lovette, Norris G., Jr.; and Ruprecht, David R., 4,324,110, Cl. 62-381.000.

Rush, Dale L.: *See*—
Cox, Howard E.; and Rush, Dale L., 4,324,224, Cl. 126-422.000.

Russo, David A.: *See*—
Gitlitz, Melvin H.; and Russo, David A., 4,324,798, Cl. 424-288.000.

Russo, Gary M.: *See*—
Kerr, Donald L.; and Russo, Gary M., 4,324,849, Cl. 430-3.000.

Rutkowski, Edward J.; Mapes, Carl R.; Wing, Steven D.; and Dawdy, Jack A., to National Gypsum Company. Metal stud. 4,324,082, Cl. 52-481.000.

Ruttgerodt, Gottlieb, to Wegmann U. Co. GmbH. Main battletank turret. 4,324,169, Cl. 89-36.00L.

S&C Electric Company: *See*—
Hall, Walter J.; and Opfer, John C., 4,324,959, Cl. 200-144.0AP.

Sabin, Thomas D.: *See*—
Mark, Vernon H.; and Sabin, Thomas D., 4,324,261, Cl. 128-740.000.

Sachs, Emanuel M. Film processing method and apparatus. 4,324,479, Cl. 354-319.000.

Sachse, Burkhard: *See*—
Koch, Manfred; Mildenberger, Hilmar; and Sachse, Burkhard, 4,324,799, Cl. 424-301.000.

Sagami Chemical Research Center: *See*—
Umemoto, Teruo, 4,324,741, Cl. 260-505.00R.

Saiger, Herbert C., to Plantation Patterns, Inc. Knockdown arm chair. 4,324,433, Cl. 297-442.000.

Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, to Toyama Chemical Co., Ltd. Antibacterial composition for medical use. 4,324,783, Cl. 424-114.000.

Sain, Bernard S.; and Dudley, James M., to Trailer Marine Transport Corporation. Tire security cap. 4,324,516, Cl. 411-5.000.

Saint, David: *See*—
Eldon, James, III; Saint, David; and Latone, Thomas L., 4,324,432, Cl. 297-377.000.

St. Regis Paper Company: *See*—
Weldon, Scott B., 4,324,820, Cl. 427-420.000.

Saito, Mamoru: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; Mori, Takashi; and Honma, Toshio, 4,324,768, Cl. 423-92.000.

Saito, Michiharu: *See*—
Terada, Katumi; and Saito, Michiharu, 4,324,472, Cl. 354-266.000.

Saito, Seiji: *See*—
Sato, Yasushi; Saito, Seiji; and Ayata, Naoki, 4,325,086, Cl. 358-296.000.

Sakaba, Masaru: *See*—
Sasaki, Katsuhiko; Sakaba, Masaru; and Hayashi, Kingo, 4,324,051, Cl. 34-20.000.

Sakai, Hiroshi: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.

Sakai, Noboru; and Shimizu, Tokuo, to Olympus Optical Co., Ltd. Thrust preventive device for the output shaft of an electric motor. 4,324,995, Cl. 310-153.000.

Sakakino, Takahiro; and Yamada, Hiroyoshi, to Omron Tateisi Electronics Co. Fluid-proof slide switch. 4,324,956, Cl. 200-16.00R.

Salvatori, Anthony L., to Salvatori Ophthalmics, Inc. Contact lens for non-rotational orientation. 4,324,461, Cl. 351-160.00H.

Salvatori Ophthalmics, Inc.: *See*—
Salvatori, Anthony L., 4,324,461, Cl. 351-160.00H.

Sambo, Claudio, to Schweizerische Lokomotiv-und Maschinenfabrik. Rail vehicle having a roll support device. 4,324,187, Cl. 105-199.00A.

Samuel, Olof; and Hellemaa, Heikki, to Rederiaktiebolaget Nordstjernan; and Oy Wartsila AB. Compressed air starter. 4,324,212, Cl. 123-179.00F.

Sanada, Shinichi: *See*—
Wada, Moriyasu; Suzuki, Shuichi; Sanada, Shinichi; and Hayase, Shuzi, 4,324,873, Cl. 525-507.000.

Sandbank, Hans A., to Andrex N.D.T. Products (U.K.) Limited. Separating apparatus. 4,324,336, Cl. 209-589.000.

Sanders Associates, Inc.: *See*—
Brodeur, Lester R., 4,325,067, Cl. 343-103.000.
Mercer, William R., 4,325,068, Cl. 343-103.000.

Sandler, Stanley R.; and Chen, Mabel M., to Pennwalt Corporation. Substituted urea compound containing 2,2,2-trichloro-1-hydroxyethyl group. 4,324,910, Cl. 564-60.000.

Sandmold Systems, Inc.: *See*—
White, Ellis S.; Zatkoff, William C.; Light, John J.; and Michen, Ramon, 4,324,392, Cl. 266-240.000.

Sandor, Joseph: *See*—
Stutz, William H., Jr.; and Sandor, Joseph, 4,324,014, Cl. 15-4.000.

Sandoz Ltd.: *See*—
Avar, Lajos; Finck, Hans-Werner; and Kalt, Evelyne, 4,324,628, Cl. 204-159.240.

Sano, Frank M.; Sliwa, Robert A.; and Golden, Edward J., to Bendix Corporation, The. Weapon firing system including weapon interrogation means. 4,324,168, Cl. 89-1.814.

Santilli, Arthur A.: *See*—
Scotese, Anthony C.; and Santilli, Arthur A., 4,324,893, Cl. 544-127.000.

Sarebjork, Karl W. H.; and Pallmar, Anders B., to Alfa-Laval AB. Method for winterizing (dewaxing) of vegetable oils. 4,324,735, Cl. 260-425.000.

Sarl dite: Astin-France-Assistance Technique Industrielle: *See*—
Corradi, Gabriel, 4,324,609, Cl. 156-470.000.

Sarrafian, Vahram K.; and Kim, Syng N., to Wiczer, Max. Post assembly for pinball game. 4,324,403, Cl. 273-127.00R.

Sarvanne, Hannu, to Oy E. Sarlin AB. Guide apparatus for a submersible pump. 4,324,531, Cl. 417-360.000.

Sasaki, Katsuhiko; Sakaba, Masaru; and Hayashi, Kingo, to Hitachi Shipbuilding & Engineering Co., Ltd. Process and apparatus for recovering heat from finely to coarsely divided material having high temperature. 4,324,051, Cl. 34-20.000.

Sasaki, Yutaka; and Moriya, Kiyoshi, to Nitto Chemical Industry Co., Ltd. Separation of tellurium from tellurium-antimony-containing metal oxide catalysts. 4,324,586, Cl. 75-69.000.

Satake Engineering Co. Ltd.: *See*—
Satake, Toshihiko, 4,324,175, Cl. 99-519.000.

Satake, Toshihiko, to Satake Engineering Co. Ltd. Apparatus for rice polishing. 4,324,175, Cl. 99-519.000.

Sato, Masaki; Okuda, Hironori; Ito, Motoya; and Makino, Yuji, to Hitachi, Ltd. Cooling medium baffling device in rotary electric machine. 4,324,993, Cl. 310-58.000.

Sato, Masanori: *See*—
Umino, Norihide; Ohishi, Tokuro; Ikezaki, Muneyoshi; Sato, Masanori; and Nagao, Taku, 4,324,800, Cl. 424-308.000.

Sato, Yasuhisa, to Canon Kabushiki Kaisha. Tele-objective lens with a movable sub-group for focusing. 4,324,458, Cl. 350-454.000.

Sato, Yasuo: *See*—
Okauchi, Tetsuo; Hiraga, Kentaro; and Sato, Yasuo, 4,324,795, Cl. 424-274.000.

Sato, Yasushi; Saito, Seiji; and Ayata, Naoki, to Canon Kabushiki Kaisha. Recording device. 4,325,086, Cl. 358-296.000.

Satoh, Ken, to Olympus Optical Co., Ltd. Apparatus for displaying video track number in viewfinder of video camera. 4,325,080, Cl. 358-127.000.

Satoh, Shin: *See*—
Matsuyama, Iwao; Susa, Kenzo; Satoh, Shin; and Suganuma, Tsuneo, 4,324,576, Cl. 65-26.000.

Satomoto, Atsushi: *See*—
Inada, Masami; Hashimoto, Nobuyuki; and Satomoto, Atsushi, 4,325,047, Cl. 337-370.000.

Saupe, Wolfgang: *See*—
Riech, Volker; Saupe, Wolfgang; and Sorgenicht, Dietrich, 4,324,126, Cl. 73-1.00J.

Sawada, Yasuhiro: *See*—
Aoki, Shinji; Ishikawa, Ryuichi; and Sawada, Yasuhiro, 4,324,759, Cl. 422-62.000.

Sawyer, Geoffrey S.: *See*—
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,324,104, Cl. 62-77.000.

Sax Zzyzx, Ltd.: *See*—
Anthony, Myron L., 4,324,068, Cl. 47-1.400.

Saxholm, Rolf. Apparatus and associated methods for use in microbiological, serological, immunological, clinical-chemical and similar laboratory work. 4,324,859, Cl. 435-33.000.

Scagnelli, George J.: *See*—
Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., 4,324,034, Cl. 29-410.000.

Schade, Otto H., Jr., to RCA Corporation. Temperature-correction network for extrapolated band-gap voltage reference circuit. 4,325,017, Cl. 323-313.000.

Schade, Otto H., Jr., to RCA Corporation. Temperature-correction network with multiple corrections as for extrapolated band-gap voltage reference circuits. 4,325,018, Cl. 323-313.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Start winding cut-out circuit for an electric motor. 4,325,012, Cl. 318-786.000.

Schaefer, Rudolf. Refrigerating or warming cabinet. 4,324,445, Cl. 312-236.000.

Schaer, Glenn R., to Koito Seisakusho Co. Ltd. Method and apparatus for replenishing an electroplating bath with metal to be deposited. 4,324,623, Cl. 204-15.000.

Schenk, Dale C.; and Van Hooydonk, Anton H. G., to International Harvester Company. Multi-section agricultural implement including latch assembly therefor. 4,324,296, Cl. 172-311.000.

Schinker, James J.: *See*—
Pryor, Harry H.; and Schinker, James J., 4,324,494, Cl. 366-156.000.

Schippmann, Guenter: *See*—
Pforr, Gerhard; Peschau, Gerhard; Schippmann, Guenter; Appl, Max; Voelkl, Erfried; and Stark, Hans, 4,324,570, Cl. 55-267.000.

Schittino, Giuseppe; and Schittino, Vincent. Snow/ice melter for automotive vehicles. 4,324,307, Cl. 180-313.000.

Schittino, Vincent: *See—*
Schittino, Giuseppe; and Schittino, Vincent, 4,324,307, Cl. 180-313.000.
Schlicht, Raymond C.: *See—*
Levine, Stephen A.; Schlicht, Raymond C.; and Chafetz, Harry, 4,324,672, Cl. 252-49.700.
Schliebener, Claus: *See—*
Wernicke, Hans J.; and Schliebener, Claus, 4,324,935, Cl. 585-314.000.
Schluderberg, Donald C., to Babcock & Wilcox Company, The. Fuel element assembly. 4,324,618, Cl. 376-434.000.
Schlusselberger, Richard, to Elin-Union AG. Process for maintaining magnesium-containing cast iron melts in a castable state. 4,324,587, Cl. 75-130.00B.
Schmid, Gustav F.: *See—*
Larsen, Ronald A.; and Schmid, Gustav F., 4,324,409, Cl. 280-12.00F.
Schmid Tool & Engineering Corp.: *See—*
Larsen, Ronald A.; and Schmid, Gustav F., 4,324,409, Cl. 280-12.00F.
Schmidlin, Robert: *See—*
Prahauser, Georg; Schmidlin, Robert; and Trede, Wolfgang, 4,324,183, Cl. 102-334.000.
Schmidt, Franz: *See—*
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Schmitt, Frederick L.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,324,923, Cl. 568-659.000.
Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., 4,324,912, Cl. 564-188.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,324,704, Cl. 252-522.00R.
Schmitt, James L.: *See—*
Golan, Kenneth F.; Goloff, Charles N.; and Schmitt, James L., 4,324,274, Cl. 137-625.680.
Schmitt, Wilhelm; and Taniguchi, Toyotake, to Carl Freudenberg, Firma. Non-return valve. 4,324,097, Cl. 60-293.000.
Schmitz, Helga. Method for the softening of tough mushrooms. 4,324,806, Cl. 426-52.000.
Schneeweiss, Manfred; Gotzenberger, Adolf; and Ohm, Aloys, to Audi NSU Auto Union Aktiengesellschaft. Wheel suspension for motor vehicles. 4,324,416, Cl. 280-661.000.
Schneider, Fred A. Humane insect trap for the live capture of spiders and the like. 4,324,062, Cl. 43-110.000.
Schnell, William J., to Baxter Travenol Laboratories, Inc. Flow reversal in a dialyzer. 4,324,662, Cl. 210-646.000.
Schonfeld, Steven E.: *See—*
Ravagnani, Frederick J.; and Schonfeld, Steven E., 4,324,281, Cl. 152-359.000.
Schoppe, Fritz. Method of improving the storage safety of pulverized brown coal. 4,324,562, Cl. 44-1.00G.
Schrecke, Horst G.; and Glockner, Hermann, to SKF Kugellagerfabriken GmbH. Device for supplying an oil-air mixture to bearing locations. 4,324,442, Cl. 308-187.000.
Schroder, Johann, to U.S. Philips Corporation. Thermal storage device. 4,324,287, Cl. 165-10.000.
Schroeder, Earle E.; and Baker, James E., to Allis-Chalmers Corporation. Universal guard. 4,324,533, Cl. 417-360.000.
Schub, Leonard, to Wonder Corporation of America, Inc. Apparatus and method of delivering depolarization mix into a dry cell can. 4,324,039, Cl. 29-623.100.
Schulz, Hans H.; Uerdingen, Walter; and Wagner, Kuno, to Bayer Aktiengesellschaft. Fixatives for dentistry and their use. 4,324,590, Cl. 106-35.000.
Schumann, Klaus: *See—*
Kaufmann, Jochen; Altenschopfer, Theodor; Schumann, Klaus; and Rings, Friedel, 4,324,677, Cl. 252-99.000.
Schurdak, Edward J.: *See—*
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Schwartz, Larry A., to Franklin Industries, Inc. Stove door construction. 4,324,223, Cl. 126-200.000.
Schwarzmann, Matthias: *See—*
Mross, Wolf D.; Titzenthaler, Eckart; Koopmann, Juergen; Vogt, Volker; and Schwarzmann, Matthias, 4,324,699, Cl. 252-463.000.
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, to TMC Corporation. Device for skis. 4,324,415, Cl. 280-605.000.
Schweizerische Lokomotiv-und Maschinenfabrik: *See—*
Sambo, Claudio, 4,324,187, Cl. 105-199.00A.
Schwob, Charles J.; Kirbabas, Nicholas; and Erin, Tim, to Mead Corporation, The. Jet device for application of liquid dye to a fabric web. 4,324,117, Cl. 68-205.00R.
Scimonelli, Don R. Headlight assembly. 4,325,105, Cl. 362-80.000.
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Scotese, Anthony C.; and Santilli, Arthur A., to American Home Products Corporation. 4-Amino-3-carboxy or cyano-1,2-dihydro-2-oxo-1,8-naphthyridine derivatives. 4,324,893, Cl. 544-127.000.
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Security Imprinter Corporation: *See—*
Barbour, William P., 4,324,178, Cl. 101-45.000.
Seely, Neil G., to Eastman Kodak Company. Camera door apparatus. 4,324,476, Cl. 354-288.000.
Seifert, Hermann: *See—*
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Seiichi Ishizaka, Director General of Agency of Industrial Science and Technology: *See—*
Suzuki, Hiroshi, 4,324,797, Cl. 424-287.000.
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Prohaska, Hans; and Seitter, Wolf, 4,325,007, Cl. 315-200.00A.
Seldner, Abraham, to Amerchol Corporation. Polyol fragrance fixatives. 4,324,703, Cl. 252-522.00R.
Selvage, Craig C.: *See—*
Gustavson, Richard E.; Selvage, Craig C.; and Whitney, Daniel E., 4,324,032, Cl. 29-407.000.
Semeraro, Claudio: *See—*
Dorigotti, Luciano; Gaviraghi, Giovanni; Pifferi, Giorgio; Pinza, Mario; and Semeraro, Claudio, 4,324,788, Cl. 424-250.000.
Sendzimir, Tadeus. Production of heavy metal coatings on only one face of steel strips. 4,324,818, Cl. 427-174.000.
Senior, Peter J.; Wright, Leonard F.; and Alderson, Barry, to Imperial Chemical Industries Limited. Extraction process. 4,324,907, Cl. 560-185.000.
Sepehri-Nik, Hossein K., to Beker Industries, Inc. Method and apparatus for beneficiating phosphate ores. 4,324,577, Cl. 71-33.000.
Servochem AB: *See—*
Wegstedt, Gunnar L., 4,324,557, Cl. 23-232.00R.
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Seto, Toru: *See—*
Honda, Mitsuyasu; Shiraishi, Yoshihiro; and Seto, Toru, 4,324,701, Cl. 252-477.00R.
Severson, Asbjorn M., to Honeywell Inc. Method of fabricating a solar absorber panel. 4,324,028, Cl. 29-157.30C.
Sevrence, Warren E., to Acco Industries, Inc. Two-piece anchorage device. 4,324,503, Cl. 403-197.000.
Sexstone, John H.; Lewis, Tom; and Milliner, Ken, to Brown & Williamson Tobacco Corporation. Apparatus for making grooves in tobacco smoke filters. 4,324,540, Cl. 425-385.000.
Seymour, Donald E.; Seymour, Greg A.; and Jaber, Mark J., to Applied Biochemists, Inc. Method of preparing a copper complex for use as an algaecide. 4,324,578, Cl. 71-67.000.
Seymour, Greg A.: *See—*
Seymour, Donald E.; Seymour, Greg A.; and Jaber, Mark J., 4,324,578, Cl. 71-67.000.
Shah, Ramesh M. High carbon content chromatographic packing and method for making same. 4,324,689, Cl. 252-428.000.
Shahinian, Lee, Jr. Surgical knife for precise depth of cut control. 4,324,044, Cl. 30-294.000.
Shank, Dane G., to Caterpillar Tractor Co. Link-coupled rotor assembly. 4,324,536, Cl. 418-53.000.
Sharkey, Robert L., to Andrew Master Hones Limited. Power supply apparatus. 4,324,534, Cl. 417-414.000.
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Shaw, Richard D.: *See—*
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., 4,324,602, Cl. 156-71.000.
Shell Oil Company: *See—*
Denison, Early B., 4,324,297, Cl. 175-45.000.
Roman, Steven A., 4,324,915, Cl. 564-454.000.
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Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., 4,324,602, Cl. 156-71.000.
Sherer, Robert B.; and Weir, Robert M., to Whirlpool Corporation. Method of attaching a removable cabinet for front-serviceable appliances. 4,324,035, Cl. 29-434.000.
Sherony, Dominic F.: *See—*
Lu, Chin H.; Sherony, Dominic F.; and Erhardt, Peter F., 4,324,851, Cl. 430-106.000.
Sherwick, Steven P.; Leapley, David G.; and Vonderhorst, James P., to Accraply, Inc. Method of labeling undersized containers. 4,324,058, Cl. 40-310.000.
Shibamoto, Nobuyori: *See—*
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Shimada, Keizo: *See—*
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Shimizu, Hisashi: *See—*
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Shimizu, Tokuo: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, 4,324,931, Cl. 570-189.000.
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Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, 4,324,598, Cl. 148-111.000.
Shiozawa, Kazuo, to Konishiroku Photo Industry Co., Ltd. Programed exposure control device. 4,324,467, Cl. 354-38.000.
Shipley Company Inc.: *See*—
Gulla, Michael; and Hartnett, Barry J., 4,324,589, Cl. 106-1.220.
Shippee, Paul. Solar heating apparatus. 4,324,228, Cl. 126-437.000.
Shiraishi, Takeichi: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Kuroda, Nobuyuki; and Miyoshi, Mitsuji, 4,324,876, Cl. 526-124.000.
Shiraishi, Yoshihiro: *See*—
Honda, Mitsuyasu; Shiraishi, Yoshihiro; and Seto, Toru, 4,324,701, Cl. 252-477.00R.
Shutt, Sidney G., to Rockwell International Corporation. Pneumatically dithered laser gyro. 4,325,033, Cl. 372-94.000.
Sibeud, Jean-Paul. Method for the automatic control of a gearbox, in particular on a motor vehicle. 4,324,322, Cl. 192-0.032.
Siecor Corporation: *See*—
Patel, Naren I., 4,324,453, Cl. 350-96.230.
Sieja, Norman F., to Eltra Corporation. Engine speed limiting circuit. 4,324,215, Cl. 123-335.000.
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Adelski, Hans-Joachim; and Volkrodt, Wolfgang, 4,324,996, Cl. 310-156.000.
Bulst, Wolf E.; and Eschler, Hans, 4,325,037, Cl. 333-194.000.
Edenharter, Georg; and Ebnet, Friedrich, 4,324,964, Cl. 200-331.000.
Ehrgott, Roland; and Meindl, Gerhard, 4,325,044, Cl. 336-67.000.
Kalender, Willi; Linke, Gerhard; and Pfeiler, Manfred, 4,324,978, Cl. 250-445.00T.
Kimpel, Rolf-Dieter, 4,325,043, Cl. 335-229.000.
Kobale, Manfred; Lorenz, Hans P.; Weingand, Kaspar; and Wengert, Rolf, 4,325,002, Cl. 313-485.000.
Stut, Hans, 4,324,989, Cl. 307-252.00J.
Thoma, Ferdinand, 4,325,126, Cl. 364-478.000.
Weihrich, Georg; Grunert, Wilfried; and Nusslin, Hans-Jorg, 4,324,944, Cl. 373-105.000.
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Symmons, Edgar B., 4,324,980, Cl. 250-505.000.
Sigma Italiana Prodotti Chimici S.p.A.: *See*—
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Sih, John C.: *See*—
Axen, Udo F.; and Sih, John C., 4,324,889, Cl. 542-426.000.
Sildve, Ants, to Teleflex Incorporated. Rotary/linear motion converter assembly (bowstring). 4,324,148, Cl. 74-108.000.
Silver, Wallace E.: *See*—
Range, Kenneth; Irwin, William J.; Reed, Russell, Jr.; and Silver, Wallace E., 4,324,599, Cl. 149-39.000.
Silverberg, Morton, to Xerox Corporation. Sheet separator. 4,324,395, Cl. 271-98.000.
Simokat, Frank L., to TII Industries Inc. Four-party automatic number identification circuit arrangements. 4,324,953, Cl. 179-17.00A.
Sinacola, James F.: *See*—
Gibbs, Dale S.; Sinacola, James F.; and Ranck, Dan E., 4,324,714, Cl. 524-113.000.
Singer Company, The: *See*—
Brown, Jack, 4,324,191, Cl. 112-277.000.
Siroky, John A. Portable drill with built-in chuck key. 4,324,512, Cl. 408-240.000.
Sivyer, Robert B. Thermowell apparatus for petrochemical applications. 4,324,945, Cl. 136-242.000.
SKF Kugellagerfabriken GmbH: *See*—
Schrecke, Horst G.; and Glockner, Hermann, 4,324,442, Cl. 308-187.000.
Skryantz, John S.: *See*—
Karayannis, Nicholas M.; and Skryantz, John S., 4,324,690, Cl. 252-429.00B.
Sletzinger, Meyer, to Merck & Co., Inc. Cephalosporin intermediates. 4,324,890, Cl. 544-021.000.
Sliwa, Robert A.: *See*—
Sano, Frank M.; Sliwa, Robert A.; and Golden, Edward J., 4,324,168, Cl. 89-1.814.
Slusky, Susan E. G.; and Trambarulo, Ralph F., to Bell Telephone Laboratories, Incorporated. Hysteretic SIS junction mixer. 4,325,144, Cl. 455-324.000.
Smiley, Charles F., to Harris Corporation. Direct function receivers and transmitters for multichannel communications system. 4,324,952, Cl. 179-1.0GS.
Smith, Douglas J.: *See*—
Mullane, William I.; and Smith, Douglas J., 4,324,246, Cl. 128-287.000.
Smith, Juan A.; Adams, Catherine L.; and Adams, Wayne M., to Union Underwear Company. Method for making fused collars and product resulting therefrom. 4,324,004, Cl. 2-131.000.
Smith Kline & French Laboratories Limited: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,324,789, Cl. 424-251.000.
Smith, Leonard L., Jr.: *See*—
Holmsen, Theodore W.; Barrons, Keith C.; and Smith, Leonard L., Jr., 4,324,581, Cl. 71-126.000.
Smith, Lori J.; and Alser, James J. Artificial eye having double convex magnifying lens. 4,324,066, Cl. 46-165.000.
Smith, Peter H., to General Electric Company. Microwave oven cavity excitation system providing controlled electric field shape for uniformity of energy distribution. 4,324,968, Cl. 219-10.55F.
Smith, Randlow: *See*—
Jones, Henry B.; and Smith, Randlow, 4,324,563, Cl. 48-62.00R.
Smith, William E., to Dow Chemical Company, The. Reimer-Tiemann aldehyde synthesis process. 4,324,922, Cl. 568-437.000.
Smusch, Gunther: *See*—
Kruger, Roland; Ciongwa, Joachim; Smusch, Gunther; and Ehrlinger, Klaus, 4,324,264, Cl. 134-68.000.
Snyder, William R.; and Feuerstein, Diane, to Betz Laboratories, Inc. Method and composition for treating aqueous mediums. 4,324,664, Cl. 210-701.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Colamonico, Armando, 4,325,030, Cl. 328-140.000.
Societe Anonyme des Usines Chausson: *See*—
Moranne, Jean-Pierre, 4,324,290, Cl. 165-173.000.
Societe Anonyme dite: Les Cables de Lyon: *See*—
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Societe Chimique des Charbonnages-CdF CHIMIE: *See*—
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,324,756, Cl. 264-322.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Wertheim, John H.; and Mishkin, Abraham R., 4,324,808, Cl. 426-385.000.
Societe Nationale Elf Aquitaine: *See*—
Foure, Michel, 4,324,718, Cl. 524-108.000.
Foure, Michel, 4,324,737, Cl. 260-429.700.
Solarein, Inc.: *See*—
Reinert, Charles P., 4,324,231, Cl. 126-449.000.
Somfai, Eva: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth nee Zalantai, Livia, 4,324,903, Cl. 560-82.000.
Sommerfeld, Gerhard. Wiping device for a ditch digging machine. 4,324,056, Cl. 37-94.000.
Sonnenberg, Karl-Heinz, to Volkswagenwerk Aktiengesellschaft. Method and apparatus for curing lacquer layers with high-energy electrons. 4,324,813, Cl. 427-44.000.
Sorgenicht, Dietrich: *See*—
Riech, Volker; Saupe, Wolfgang; and Sorgenicht, Dietrich, 4,324,126, Cl. 73-1.00J.
South, Barry: *See*—
South, David B.; and South, Barry, 4,324,074, Cl. 52-2.000.
South, David B.; and South, Barry. Building structure and method of making same. 4,324,074, Cl. 52-2.000.
Soutsos, Michael D. Drill pipe clamp. 4,324,157, Cl. 81-57.170.
Sowers, Michael G.; Creek, Ronald B.; and DeFur, Donovan D., to Electric Power Research Institute, Inc. Intermediate heat exchanger for a liquid metal cooled nuclear reactor and method. 4,324,617, Cl. 376-405.000.
Soyland, Ingebret. Steering mechanism for excavators and the like. 4,324,305, Cl. 180-134.000.
Specht, Steven J.: *See*—
Kircher, Morton S.; and Specht, Steven J., 4,324,634, Cl. 204-228.000.
Spedding, Oliver T. Safety device for use with a container. 4,324,339, Cl. 215-219.000.
Sperry Corporation: *See*—
Halls, Lawrence M.; and McIlwain, Irwin D., 4,324,092, Cl. 56-298.000.
Priepke, Edward H.; and Martenas, Wayne B., 4,324,324, Cl. 192-101.000.
Zscheile, John W., Jr., 4,325,138, Cl. 375-1.000.
Spin Physics, Inc.: *See*—
Meckel, Benjamin B.; and Bromley, Emily I., 4,324,631, Cl. 204-192.00M.
Spingler, Werner, to ESGE-Marby GmbH & Co. Rechargeable battery unit for bicycle illumination. 4,325,108, Cl. 362-183.000.
Sprague Electric Company: *See*—
Maher, Galeb H., 4,324,750, Cl. 264-61.000.
Rodriguez, George H., 4,325,051, Cl. 338-220.000.
Sprecker, Mark A.: *See*—
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SPS Technologies, Inc.: *See*—
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Spurlin, Stephen F.; Lentz, Carl A.; and Miller, Clement P., to General Motors Corporation. Power limiting control for retarder with friction brake. 4,324,320, Cl. 188-271.000.
Stackpole Components Company: *See*—
Josemans, Leo J. M., 4,324,957, Cl. 200-16.00C.
Staiger, Hans: *See*—
Burkhardt, Friedrich; and Staiger, Hans, 4,324,027, Cl. 29-33.00P.
Standard Microsystems Corporation: *See*—
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Grasselli, Robert K.; and Guttmann, Andrew T., 4,324,908, Cl. 560-210.000.

Standard Oil Company (Indiana): *See*—
Arzoumanidis, Gregory G.; and Lee, Sam S., 4,324,693, Cl. 252-429.00B.
Karayannis, Nicholas M.; and Skryantz, John S., 4,324,690, Cl. 252-429.00B.
Standard Precision, Inc.: *See*—
Hagen, Magnus F.; and Rask, Richard O., 4,324,439, Cl. 308-3.800.
Stankiewicz, Stanley L.: *See*—
Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., 4,324,548, Cl. 433-126.000.
Stansbury, Benjamin H., Jr., to Pocket Supportable Atomizer Device Trust. Pocket atomizer. 4,324,362, Cl. 239-211.000.
Stark, Hans: *See*—
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Stauffer Chemical Company: *See*—
Eugley, Susan L., 4,324,811, Cl. 426-656.000.
Reale, Michael J., 4,324,865, Cl. 521-107.000.
Stearn, Richard J., to Balteau Sonatest Limited. Ultrasonic measurement of thickness. 4,324,141, Cl. 73-627.000.
Steelcase Inc.: *See*—
Beukema, Duane M.; and Knoblauch, Jack R., 4,324,382, Cl. 248-406.000.
Steigenberger, Richard; and Hirt, Dieter, to MAN Maschienfabrik Augsburg Nurnberg. Containing bearing for supercritical rotors. 4,324,440, Cl. 308-26.000.
Stein, Reinhardt P., to American Home Products Corporation. 1,2,3 Oxadiazolium salts. 4,324,897, Cl. 548-125.000.
Stein, Thomas R.: *See*—
Angevine, Philip J.; and Stein, Thomas R., 4,324,645, Cl. 208-50.000.
Steinau, Peter: *See*—
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Steiner, Herbert; and Magg, Johann, to Bosch-Siemens Hausgerage GmbH. Heating element assembly with a PTC electric heating element. 4,324,974, Cl. 219-553.000.
Steinhagen, Horst G., to Twin Disc, Incorporated. Power delivery system having a pressure modulated hydrodynamic retarder for controlling a load. 4,324,387, Cl. 254-310.000.
Steinhardt, Maxwell, to Qume Corporation. Multiple index printwheel. 4,324,498, Cl. 400-144.200.
Steinke, Thomas J. Self-regulating fluid control valves. 4,324,506, Cl. 405-96.000.
Stenkvist, Sven-Einar; and Rappinger, Bo, to ASEA Aktiebolag. DC Arc furnace hearth construction. 4,324,943, Cl. 373-72.000.
Step-Lite Footwear Inc.: *See*—
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Stephans, Robert: *See*—
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Stephens, Joseph W.: *See*—
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Stephenson, Edward G.; and Taylor, Tom, to Crompton Parkinson Limited. Method of inserting a powder in the manufacture of electrical dry cells. 4,324,754, Cl. 264-268.000.
Stephenson, Robert L., to Allied Corporation. Passive seat belt system. 4,324,418, Cl. 280-802.000.
Stepp, Jesse W. Casting net holding device. 4,324,061, Cl. 43-4.500.
Sterner, Maurice E., Jr., to Product Design & Development, Inc. Insulated multiple component single plane building structure portal closure. 4,324,072, Cl. 49-129.000.
Stevens, Emma S., to Stevens, Emma S.; and Holmes, Stephen A. Foot powder. 4,324,785, Cl. 424-195.000.
Stevenson, David J., to Clayton Manufacturing Company. Torque measuring device. 4,324,133, Cl. 73-117.000.
Stitzer, Steven N., to United States of America, Air Force. Full duplex communication system apparatus using frequency selective limiters. 4,325,140, Cl. 455-19.000.
Stockel, Joseph F., to Communications Satellite Corp. Metal-oxide-hydrogen cell with variable conductant heat pipe. 4,324,845, Cl. 429-101.000.
Stone and Webster Eng. Cor.: *See*—
Charlton, Webster T., 4,324,315, Cl. 184-15.00R.
Stonestreet, Jimmy B.; and Rohrbaugh, John M. Knock down weather and salt resistant salt and mineral feeder for cattle. 4,324,202, Cl. 119-51.00R.
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Streit, Werner: *See*—
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Strickland, James C. Amplifier for driving electrostatic loudspeakers. 4,324,950, Cl. 179-1.00A.
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Strong, Grant H.; and Strong, Kline D., to Strong Research. Torch ignition apparatus and method. 4,324,211, Cl. 123-143.00A.
Strong, Kline D.: *See*—
Strong, Grant H.; and Strong, Kline D., 4,324,211, Cl. 123-143.00A.
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Stubben, David R.; and Rains, Lyle V., to Atari, Inc. Method and system for generating moving objects on a video display screen. 4,324,401, Cl. 273-85.00G.
Stut, Hans, to Siemens Aktiengesellschaft. Solid-state relay. 4,324,989, Cl. 307-252.00J.
Stutz, William H., Jr.; and Sandor, Joseph, to Innovative Computer Products. Cassette cleaner. 4,324,014, Cl. 15-4.000.
Sudan, Krishan K.; and Berchem, Antoine, to Reichhold Limited. Pulp waste liquor-phenolic resin binder. 4,324,747, Cl. 264-13.000.
Suenaga, Masaki: *See*—
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Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; Mori, Takashi; and Honma, Toshio, to Mizusawa Kagaku Kozyo Kabushiki Kaisha. Process for preparation of lead compounds. 4,324,768, Cl. 423-92.000.
Sugai Chemical Industry Co., Ltd.: *See*—
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Sugano, Kazuhiko: *See*—
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Sugimoto, Hiroshi; Nakano, Jiro; and Yanagihara, Noritaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for driver-dependent shift control of a vehicle sub-transmission which maximizes fuel economy. 4,324,153, Cl. 74-866.000.
Sugioka, Syuji: *See*—
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Sugita, Toshio; Morinushi, Takanobu; and Hanashima, Shigeharu. Method for forming a dental caries preventive coating. 4,324,630, Cl. 204-192.00R.
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Tabe, Yutaka; Takamoto, Hiromitsu; Shimada, Keizo; and Sugita, Yasusaburo, 4,324,706, Cl. 523-149.000.
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Sullivan, Donald P., to Universal Mobility, Inc. Temperature control system and method for an automated guideway transit system. 4,324,184, Cl. 104-279.000.
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Okamoto, Yukikazu; and Tagami, Manabu, 4,324,781, Cl. 424-78.000.
Sumitomo Electric Industries, Ltd.: *See*—
Miyake, Masayoshi, 4,324,837, Cl. 428-375.000.
Sun, Lu; and Cilderman, Janis J., to Otis Elevator Company. Elevator guide rail mounting arrangement. 4,324,360, Cl. 238-349.000.
Sundkvist, Per H.; and Oborg, Lars. Device for securing a teat to a pacifier. 4,324,249, Cl. 128-360.000.
Sunkist Growers, Inc.: *See*—
Conway, Tim D.; and Paddock, Paul F., 4,324,335, Cl. 209-586.000.
Sunohara, Mineo; Okubo, Yasuhiko; Taketa, Mitsugu; Nakai, Yoshiyuki; and Miyazaki, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Zero-phase current transformer. 4,325,096, Cl. 361-45.000.
Sunwil Manufacturing Ltd.: *See*—
Wilson, Charles E.; Wilson, Arnold W.; and Morley, Reginald H., 4,324,429, Cl. 296-100.000.
Susa, Kenzo: *See*—
Matsuyama, Iwao; Susa, Kenzo; Satoh, Shin; and Suganuma, Tsuneo, 4,324,576, Cl. 65-26.000.
Suszynski, Edward D., to Kraft Systems, Inc. Control stick assembly. 4,325,050, Cl. 338-128.000.
Suzuki, Atsushi: *See*—
Harada, Masato; Yamada, Sadahiko; Suzuki, Atsushi; and Masuda, Jun, 4,324,875, Cl. 526-115.000.
Suzuki, Haruo: *See*—
Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, 4,324,629, Cl. 204-180.00P.
Suzuki, Hiroshi, to Seiichi Ishizaka, Director General of Agency of Industrial Science and Technology. Metal soap compositions. 4,324,797, Cl. 424-287.000.
Suzuki, Koji: *See*—
Tano, Eiichi; and Suzuki, Koji, 4,324,462, Cl. 354-23.00D.
Tano, Eiichi; and Suzuki, Koji, 4,324,468, Cl. 354-149.000.
Suzuki, Minoru: *See*—
Tagawa, Kazuaki; Suzuki, Minoru; and Hashimoto, Makoto, 4,324,483, Cl. 355-3.0DD.
Suzuki, Shuichi: *See*—
Wada, Moriyasu; Suzuki, Shuichi; Sanada, Shinichi; and Hayase, Shuzi, 4,324,873, Cl. 525-507.000.
Sven Svenning Konsult AB: *See*—
Svenning, Sven G. W., 4,324,528, Cl. 416-132.00B.
Svenning, Sven G. W., to Sven Svenning Konsult AB. Automatic regulating device for keeping constant the speed of wind-powered propellers. 4,324,528, Cl. 416-132.00B.

Svoboda, Josef: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,324,415, Cl. 280-605.000.
Svobodova, Antonin: *See—*
Jiruse, Jaroslav; and Svobodova, Antonin, 4,324,180, Cl. 101-216.000.
Swanson, Lynwood W.: *See—*
Wolfe, John E.; and Swanson, Lynwood W., 4,325,000, Cl. 313-336.000.
Swanson, Roger C.: *See—*
Colley, Stephen R.; Cox, George W.; Rattner, Justin R.; and Swanson, Roger C., 4,325,120, Cl. 364-200.000.
Sweeney, Charles T. Generation of chlorine-chlorine dioxide mixtures. 4,324,635, Cl. 204-266.000.
Swihart, Terence J., to Dow Corning Corporation. Lubricant-bearing fibers and lubricant compositions therefor. 4,324,720, Cl. 260-185.000.
Swisher, Carolyn L. Self-watering planter. 4,324,070, Cl. 47-81.000.
Switchcraft, Inc.: *See—*
Valleau, Robert L., 4,324,958, Cl. 200-16.00F.
Symmons, Edgar B., to Siemens Medical Laboratories, Inc. Electron exit window assembly for a linear accelerator. 4,324,980, Cl. 250-505.000.
Szabo, Gabor: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth nee Zalantai, Livia, 4,324,903, Cl. 560-82.000.
Szatkowski, Paul R.: *See—*
Louderback, Allan L.; and Szatkowski, Paul R., 4,324,687, Cl. 252-408.000.
Szirt nee Kiszelly, Eniko: *See—*
Benko, Pal; Gelleri, Andras; Hajos, Gyorgy; Messmer, Andras; Pallos, Laszlo; Petocz, Lujza; Kosoczky, Ibolya; Grasser, Katalin; Gorog, Peter; and Szirt nee Kiszelly, Eniko, 4,324,894, Cl. 544-128.000.
Szlucha, Thomas F., to Xerox Corporation. Pressure roll cleaning device. 4,324,482, Cl. 355-3.0FU.
Tabe, Yutaka; Takamoto, Hiromitsu; Shimada, Keizo; and Sugita, Yasusaburo, to Teijin Limited; and Adebono Brake Industry Co., Ltd. Friction material. 4,324,706, Cl. 523-149.000.
Tadokoro, Eiichi: *See—*
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.
Tagami, Manabu: *See—*
Okamoto, Yukikazu; and Tagami, Manabu, 4,324,781, Cl. 424-78.000.
Tagawa, Kazuaki; Suzuki, Minoru; and Hashimoto, Makoto, to Ricoh Company, Ltd. Magnetic brush development apparatus. 4,324,483, Cl. 355-3.0DD.
Taguchi, Kenichi: *See—*
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, 4,324,931, Cl. 570-189.000.
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, to Nisshin Flour Milling Co. Ltd. Decaprenylamine derivatives. 4,324,916, Cl. 564-462.000.
Tai, Masaru: *See—*
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.
Takagi, Shoji: *See—*
Yamashita, Kiyoshi; and Takagi, Shoji, 4,324,088, Cl. 53-527.000.
Takagishi, Haruyoshi: *See—*
Kita, Ryuji; Komai, Hisataka; Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,324,713, Cl. 523-457.000.
Takahashi, Hisao: *See—*
Kimoto, Tetsuo; Takahashi, Hisao; Koshiishi, Hiromichi; Shinkai, Yasuhiro; and Kawabata, Toshimi, 4,324,598, Cl. 148-111.000.
Takahashi, Masaaki: *See—*
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,324,929, Cl. 570-127.000.
Takahashi, Tadashi: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, 4,325,114, Cl. 363-68.000.
Takahashi, Toshihiro: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,324,916, Cl. 564-462.000.
Takahashi, Toshio, to Eisai Co., Ltd. Examination apparatus for milk drawn from quarter mammae of a milk cow. 4,325,028, Cl. 324-442.000.
Takahata, Masahiro: *See—*
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.
Takamoto, Hiromitsu: *See—*
Tabe, Yutaka; Takamoto, Hiromitsu; Shimada, Keizo; and Sugita, Yasusaburo, 4,324,706, Cl. 523-149.000.
Takasaka, Nobuo: *See—*
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, 4,324,931, Cl. 570-189.000.
Takashita, Yutaka: *See—*
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.
Takayama, Syuichi, to Olympus Optical Co., Ltd. Light source apparatus for endoscope. 4,324,466, Cl. 354-33.000.
Takeda Chemical Industries, Ltd.: *See—*
Okauchi, Tetsuo; Hiraga, Kentaro; and Sato, Yasuo, 4,324,795, Cl. 424-274.000.
Takeda, Renzo: *See—*
Kobayashi, Yasuhiro; and Takeda, Renzo, 4,324,615, Cl. 376-267.000.
Takeda, Tamio, to Trio Kabushiki Kaisha. Tone arm bearing system. 4,325,131, Cl. 369-255.000.
Takekoshi, Tohru, to General Electric Company. Method for making polyimides. 4,324,882, Cl. 528-206.000.
Takemura, Yasuo; and Katayama, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-state imaging device driving system. 4,324,988, Cl. 307-221.00D.
Taketa, Mitsugu: *See—*
Sunohara, Mineo; Okubo, Yasuhiko; Taketa, Mitsugu; Nakai, Yoshiyuki; and Miyazaki, Yukio, 4,325,096, Cl. 361-45.000.
Takeuchi, Atsushi, to Nippon Gakki Seizo Kabushiki Kaisha. Device for controlling pickup arm movement in linear tracking pickup arm apparatus. 4,325,016, Cl. 318-640.000.
Takeya, Yasushi: *See—*
Aoki, Shin-Ichi; and Takeya, Yasushi, 4,324,960, Cl. 200-144.00B.
Takiguchi, Takao: *See—*
Matsuzaki, Meiki; Okabe, Hiroshi; Tanaka, Seishiro; Takiguchi, Takao; and Onodera, Kunikatsu, 4,324,801, Cl. 424-311.000.
Talon, Inc.: *See—*
Berry, Grant E.; Becker, Wayne A.; Bahr, Karl E.; Scagnelli, George J.; Molnar, Frank J.; McDonald, Ronald K.; and Manning, Harry F., 4,324,034, Cl. 29-410.000.
MacFee, Norman W., 4,324,033, Cl. 29-408.000.
Talres Development (N.A.) N.V.: *See—*
Rathbone, Elner B., 4,324,888, Cl. 536-122.000.
Tamaki, Nobuo, to Casio Computer Co., Ltd. Voltage selector circuit. 4,324,991, Cl. 307-443.000.
Tamashasky, Joseph A.: *See—*
Bankes, Kristen E.; Large, Donald M.; Reinhard, Fred J.; and Tamashasky, Joseph A., 4,324,600, Cl. 156-64.000.
Tamborski, Christ: *See—*
Christian, John B.; and Tamborski, Christ, 4,324,671, Cl. 252-49.600.
Christian, John B.; and Tamborski, Christ, 4,324,673, Cl. 252-51.50R.
Tamura, Kohki: *See—*
Ebato, Noboru; Kahara, Toshiki; and Tamura, Kohki, 4,324,828, Cl. 429-209.000.
Tamura, Masanori: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Tamura, Masanori; and Yuasa, Sakae, 4,324,877, Cl. 526-127.000.
Tamura, Sadahiro: *See—*
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,325,035, Cl. 331-96.000.
Tanabe Seiyaku Co., Ltd.: *See—*
Umino, Norihide; Ohishi, Tokuro; Ikezaki, Muneyoshi; Sato, Masanori; and Nagao, Taku, 4,324,800, Cl. 424-308.000.
Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Menu responsible automatic sensor selection in a cooking utensil. 4,324,966, Cl. 219-10.55B.
Tanaka, Haruo: *See—*
Omura, Satoshi; Tanaka, Haruo; Awaya, Juichi; and Hata, Toju, 4,324,728, Cl. 260-345.200.
Tanaka, Isamu: *See—*
Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, 4,324,629, Cl. 204-180.00P.
Tanaka, Kazunori: *See—*
Kishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, 4,325,064, Cl. 340-753.000.
Tanaka, Keiji: *See—*
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.
Tanaka, Seishiro: *See—*
Matsuzaki, Meiki; Okabe, Hiroshi; Tanaka, Seishiro; Takiguchi, Takao; and Onodera, Kunikatsu, 4,324,801, Cl. 424-311.000.
Tanaka, Tsugio; Hashimoto, Kohichi; and Nagasaka, Yukio, to Atom Chemical Paint Co., Ltd. Melt-adhesive traffic paint composition. 4,324,711, Cl. 523-172.000.
Tang, Marian C.: *See—*
Vogel, Diane C.; Tang, Marian C.; and Reichelderfer, Richard F., 4,324,611, Cl. 156-643.000.
Tang, Woei S. Vase-type illuminative device. 4,325,110, Cl. 362-806.000.
Tani, Isao. Device for mounting an electrical circuit component part such as an electrolytic capacitor. 4,324,329, Cl. 206-328.000.
Taniguchi, Toyotake: *See—*
Schmitt, Wilhelm; and Taniguchi, Toyotake, 4,324,097, Cl. 60-293.000.
Tano, Eiichi; and Suzuki, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure time control circuit for camera. 4,324,462, Cl. 354-23.00D.
Tano, Eiichi; and Suzuki, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric source circuit for camera. 4,324,468, Cl. 354-149.000.
Tantram, Anthony D. S.; and Chan, Yat S., to City Technology Limited. Gas sensor. 4,324,632, Cl. 204-195.00P.
Taylor, Owen S.; and Broniarek, Czeslaw A., to Westinghouse Electric Corp. Dampened brush system. 4,324,997, Cl. 310-248.000.

Taylor, Raymond G., to Western Electric Company, Incorporated. Dialing circuits and methods for electronic telephone sets. 4,324,954, Cl. 179-90.00B.

Taylor, Tom: *See—*
Stephenson, Edward G.; and Taylor, Tom, 4,324,754, Cl. 264-268.000.

Teijin Limited: *See—*
Tabe, Yutaka; Takamoto, Hiromitsu; Shimada, Keizo; and Sugita, Yasusaburo, 4,324,706, Cl. 523-149.000.

Telautograph Corporation: *See—*
Rai, Raghuvir, 4,325,071, Cl. 346-139.00C.

Teleflex Incorporated: *See—*
Sildve, Ants, 4,324,148, Cl. 74-108.000.

TeleMine Company, Inc., The: *See—*
Seaton, John C.; and Cohen, Leonard, 4,325,078, Cl. 358-117.000.

Telex Communications, Inc.: *See—*
Dust, James A., 4,324,355, Cl. 226-190.000.

Tenneco Chemicals, Inc.: *See—*
Cordes, William F., III; Goodman, Donald; and Miller, Robert S., 4,324,874, Cl. 526-84.000.

Terada, Katumi; and Saito, Michiharu, to Olympus Optical Company Ltd. Switch for camera. 4,324,472, Cl. 354-266.000.

Teraji, Tsutomu: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hemmi, Keiji; and Goto, Jiro, 4,324,892, Cl. 544-28.000.

Terasaki Denki Sangyo Kabushiki Kaisha: *See—*
Murai, Wasaburo, 4,325,041, Cl. 335-35.000.

Terminal Data Corporation: *See—*
Kraemer, Edward J.; Therien, Robert D.; Rudy, Michael W.; Walsh, Frederick E.; Lee, Han J.; Bell, Ronald; and Horning, Thomas D., 4,324,474, Cl. 355-65.000.

Terunuma, Hiroshi, to Nippon Kogaku K.K. Light intercepting device of a camera. 4,324,470, Cl. 354-214.000.

Tesmann, Holger: *See—*
Meffert Alfred; and Tesmann, Holger, 4,324,740, Cl. 260-502.40R.

Texaco Inc.: *See—*
Castagnos, Leonce F., Jr.; Menzies, William R., III; and Pratt, Roy E., 4,324,688, Cl. 252-417.000.
Jones, Henry B.; and Smith, Randlow, 4,324,563, Cl. 48-62.00R.
Levine, Stephen A.; Schlicht, Raymond C.; and Chafetz, Harry, 4,324,672, Cl. 252-49.700.
Lewis, Paul H.; and Vartuli, James C., 4,324,697, Cl. 252-455.00Z.
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., 4,324,698, Cl. 252-455.00Z.
McConnell, Thomas T., 4,324,917, Cl. 564-479.000.
Pickles, Robert A., 4,324,502, Cl. 403-104.000.
Wong, Kenny; and Hall, Wilbur L., 4,324,291, Cl. 166-252.000.

Texas Instruments Incorporated: *See—*
Ishii, Kaoru, 4,325,093, Cl. 360-120.000.

Tezuka, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Current stabilizer. 4,325,019, Cl. 323-315.000.

Therien, Robert D.: *See—*
Kraemer, Edward J.; Therien, Robert D.; Rudy, Michael W.; Walsh, Frederick E.; Lee, Han J.; Bell, Ronald; and Horning, Thomas D., 4,324,474, Cl. 355-65.000.

Thermal Dynamics Corporation: *See—*
Frappier, Michael B., 4,324,971, Cl. 219-121.0PV.

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Convertible rail-highway lateral track set off apparatus. 4,324,186, Cl. 105-177.000.

Thoma, Ferdinand, to Siemens Aktiengesellschaft. Centrally controlled conveyor system. 4,325,126, Cl. 364-478.000.

Thomas, David W. Seed drill apparatus. 4,324,347, Cl. 221-237.000.

Thompson, Kenneth W. Elastomeric apparatus for pressure dispensing of fluid. 4,324,350, Cl. 222-212.000.

Thomson-CSF: *See—*
Rouchon, Jean M.; and Lepeytre, Jean P., 4,325,083, Cl. 358-228.000.

Thormack Sealants Limited: *See—*
Cottingham, Richard L.; Thorpe, David J.; and Bickerstaff, Eric, 4,324,504, Cl. 404-74.000.

Thornton, Donald I.: *See—*
Peyton, Richard H.; and Thornton, Donald I., 4,324,660, Cl. 210-440.000.

Thorpe, David J.: *See—*
Cottingham, Richard L.; Thorpe, David J.; and Bickerstaff, Eric, 4,324,504, Cl. 404-74.000.

Thrasher, George E., Jr.; and Lombardi, David, to Master Pneumatic-Detroit, Inc. Injection lubricator controlled by counting mechanism. 4,324,316, Cl. 184-29.000.

Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., to Research Triangle Institute. Inhibition of respiratory syncytial virus-induced cell fusion by amidino compounds. 4,324,794, Cl. 424-273.00B.

TII Industries Inc.: *See—*
Smokat, Frank L., 4,324,953, Cl. 179-17.00A.

Tiltscher, Gerald, to Mannesmann Aktiengesellschaft. Reprogrammable control apparatus. 4,325,130, Cl. 364-900.000.

Ting, Patrick: *See—*
Goldstein, Henry; Fly, Walter; Ting, Patrick; and Chicoye, Etzer, 4,324,810, Cl. 426-600.000.

Tinkle, Anthony R.: *See—*
Wener, Kenneth R.; and Tinkle, Anthony R., 4,324,310, Cl. 181-116.000.

Tisone, Thomas C.: *See—*
Zaghi, Hooshmand; and Tisone, Thomas C., 4,325,048, Cl. 338-3.000.

Titoff, Juha, to Enso-Gutzeit Osakehito . Lime sludge press unit. 4,324,659, Cl. 210-386.000.

Titzenthaler, Eckart: *See—*
Mross, Wolf D.; Titzenthaler, Eckart; Koopmann, Juergen; Vogt, Volker; and Schwarzmann, Matthias, 4,324,699, Cl. 252-463.000.

TMC Corporation: *See—*
Schweizer, Gottfried; Kubelka, Axel; Stritzl, Karl; and Svoboda, Josef, 4,324,415, Cl. 280-605.000.

Tohoku Metal Industries, Ltd.: *See—*
Endo, Masanori; and Horiuchi, Kentaro, 4,325,042, Cl. 335-208.000.

Tokan Kogyo Kabushiki Kaisha: *See—*
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,324,341, Cl. 220-258.000.
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,324,342, Cl. 220-268.000.

Tokarzewski, Richard J.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,324,923, Cl. 568-659.000.

Tokico Ltd.: *See—*
Karasudani, Yasuo, 4,324,318, Cl. 188-73.310.
Miyata, Yasuji; and Hirose, Kazuhiko, 4,324,144, Cl. 73-861.770.

Tokyo Shibaura Denki Kabushiki Kaisaha: *See—*
Wada, Moriyasu; Suzuki, Shuichi; Sanada, Shinichi; and Hayase, Shuzi, 4,324,873, Cl. 525-507.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kobayashi, Sumio; Takahashi, Tadashi; and Ino, Hidetoshi, 4,325,114, Cl. 363-68.000.
Otsuka, Kenichi, 4,325,112, Cl. 363-42.000.
Takemura, Yasuo; and Katayama, Yoshitaka, 4,324,988, Cl. 307-221.00D.
Tezuka, Hideharu, 4,325,019, Cl. 323-315.000.
Yamashita, Kiyoshi; and Takagi, Shoji, 4,324,088, Cl. 53-527.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Osada, Yoshihide; and Sugioka, Syuji, 4,325,074, Cl. 357-37.000.

Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Nakai, Hiromitu, to Hitaci, Ltd. Method of forming a fluorescent screen for a color picture tube. 4,324,850, Cl. 430-24.000.

Tomlie, Robert J., Jr., to Pitney Bowes Inc. High voltage power supply. 4,325,113, Cl. 363-60.000.

Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Macro photographic change-over device for zoom lens barrel. 4,324,457, Cl. 350-430.000.

Tondeur, Daniel: *See—*
Jacob, Philippe; and Tondeur, Daniel, 4,324,566, Cl. 55-28.000.

Toray Industries, Inc.: *See—*
Inouye, Yoshinori; and Ohkubo, Tadahiko, 4,324,368, Cl. 242-18.0PW.

Torck, Bernard; Convers, Alaio; Duee, Didier; and Mikitenko, Paul, to Institut Francais du Petrole. Process for removing isobutene from a C_4 cut and producing methyl tert-butyl ether. 4,324,924, Cl. 568-697.000.

Totoku Electric Co., Ltd.: *See—*
Kubota, Misao; Hanai, Yoshitada; and Yamaguchi, Toshiaki, 4,324,680, Cl. 252-182.100.

Towns, Mark E.: *See—*
Abnett, Albert C.; and Towns, Mark E., 4,325,128, Cl. 364-511.000.

Toyama Chemical Co., Ltd.: *See—*
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.

Toyo Kogyo Co., Ltd.: *See—*
Hara, Takanori; Yoshinaga, Makoto; Yano, Haruto; and Matumura, Noriyasu, 4,324,986, Cl. 307-10.0LS.

Toyo Seikan Kaisha Ltd.: *See—*
Kobayashi, Seishichi; Mori, Tatsuo; and Morofuji, Akihiko, 4,324,822, Cl. 428-35.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Oshima, Syoiti; and Ida, Shuichiro, 4,324,152, Cl. 74-606.00R.
Sugimoto, Hiroshi; Nakano, Jiro; and Yanagihara, Noritaka, 4,324,153, Cl. 74-866.000.
Ushijima, Fumihiro; and Fukumura, Kagenori, 4,324,321, Cl. 192-13.00R.

Trackman, Marshall H.: *See—*
Moon, Suhdok D.; and Trackman, Marshall H., 4,324,500, Cl. 400-664.000.

Trailer Marine Transport Corporation: *See—*
Sain, Bernard S.; and Dudley, James M., 4,324,516, Cl. 411-5.000.

Trambarulo, Ralph F.: *See—*
Slusky, Susan E. G.; and Trambarulo, Ralph F., 4,325,144, Cl. 455-324.000.

Trane Company, The: *See—*
Brett, William C., 4,324,286, Cl. 165-2.000.

Transportation Security, Inc.: *See—*
Michelson, Thorwald J., 4,324,426, Cl. 292-281.000.

Trede, Wolfgang: *See—*
Prahauser, Georg; Schmidlin, Robert; and Trede, Wolfgang, 4,324,183, Cl. 102-334.000.

Tredennick, Harry L.: *See—*
Gunter, Thomas G.; and Tredennick, Harry L., 4,325,121, Cl. 364-200.000.

Treine, Bernd: *See—*
Naumann, Gerd; and Treine, Bernd, 4,324,965, Cl. 219-10.55F.

Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for hydrogenation of damascenone, products produced thereby and organoleptic uses of said products. 4,324,704, Cl. 252-522.00R.
Trihey, John M. Solar tracking device. 4,324,225, Cl. 126-425.000.
Trinks, Roland: *See*
Drenckhan, Jurgen; and Trinks, Roland, 4,324,492, Cl. 356-345.000.
Trio Kabushiki Kaisha: *See*
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Urban, Peter, to Kusters, Eduard. Metal strip cold-reduction mill. 4,324,122, Cl. 72-41.000.

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Vanderveen, John W.; and Malick, Emil A., to Provesta Corporation. Centrifugal pump. 4,324,527, Cl. 415-213.00B.

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Van Dine, Gilbert A., to Bell Telephone Laboratories, Incorporated. Circuit for combining delta modulated signals. 4,325,139, Cl. 375-28.000.

Van Dommelen, Dirk J.; and Greenup, Christopher J. Self supporting damp-proof course. 4,324,075, Cl. 52-2.000.

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van Gorkom, Gerardus G. P.; and Hoeberechts, Arthur M. E., to U.S. Philips Corporation. Semiconductor device and method of manufacturing same, as well as a pick-up device and a display device having such a semiconductor device. 4,325,084, Cl. 358-241.000.

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Varga, Julianna K., to Akzona Incorporated. Shapeable tertiary amine N-oxide solution of cellulose, shaped cellulose product made therefrom and process for preparing the shapeable solution and cellulose products. 4,324,593, Cl. 106-203.000.

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Vaughn, Howard A., Jr., to General Electric Company. Silicone resin coating composition. 4,324,712, Cl. 524-767.000.

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Vesterager, Peter K. R., to Radiometer A/S. Electrode device. 4,324,256, Cl. 128-635.000.

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Vinson, Roy D. Permanent-magnet-levitated transportation system. 4,324,185, Cl. 104-283.000.

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Vogel, Diane C.; Tang, Marian C.; and Reichelderfer, Richard F., to Branson International Plasma Corporation. Process and gas mixture for etching silicon dioxide and silicon nitride. 4,324,611, Cl. 156-643.000.

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von Halasz, Sigmar-Peter, to Hoechst Aktiengesellschaft. 2,3-Dichloro-2-trifluoromethyl-1,1,1,3,4,4,5,5,5-nonafluoropentane and process for its manufacture. 4,324,930, Cl. 570-134.000.

vor der Bruck, Dieter; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Water-soluble substituted aminocarbonyl monoazo dyestuffs. 4,324,722, Cl. 260-207.000.

vor der Bruck, Dieter; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Monoazo dyestuffs. 4,324,723, Cl. 260-207.100.

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WABCO Fahrzeugbremsen GmbH: *See*—
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Wakabayashi, Makoto: *See*—
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Walsh, Frederick E.: *See*—
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Walter, Roy A. Method of applying cementitious material to a mortar joint. 4,324,084, Cl. 52-744.000.

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Heidenreich, Karl-Heinz; and Wachtelborn, Helmut, 4,325,024, Cl. 324-99.00D.

Ward, John D. Retrofitting methods and retrofitted hydraulic drives. 4,324,275, Cl. 137-876.000.

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Watanabe, Tadahiro: *See*—
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Wedel, John A.: *See*—
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Wegstedt, Gunnar L., to Servochem AB. Method and apparatus for degassing and analysis of foaming liquids. 4,324,557, Cl. 23-232.00R.

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Weichel, Ernst. Agricultural implement attachable to a tractor. 4,324,295, Cl. 172-28.000.

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Weihrich, Georg; Grunert, Wilfried; and Nusslin, Hans-Jorg, to Siemens Aktiengesellschaft. Arrangement for controlling the electrodes of an arc furnace. 4,324,944, Cl. 373-105.000.

Wein, Franz, to Machinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co KG. Regulating transformer. 4,325,020, Cl. 323-340.000.

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Kobale, Manfred; Lorenz, Hans P.; Weingand, Kaspar; and Wengert, Rolf, 4,325,002, Cl. 313-485.000.

Weir, John R. Scale magnifier. 4,324,050, Cl. 33-488.000.

Weir, Robert M.: *See*—
Sherer, Robert B.; and Weir, Robert M., 4,324,035, Cl. 29-434.000.

Weisenburger, Lawrence P.; and Delguidice, Henry L., to AMP Inc. Drop wire terminal. 4,324,450, Cl. 339-97.00R.

Weiss, Horst: *See*—
Ranke, Gerhard; and Weiss, Horst, 4,324,567, Cl. 55-43.000.

Weitman and Konrad GmbH & Co. KG: *See*—
Muz, Edwin, 4,324,198, Cl. 118-630.000.

Welch, David: *See*—
Luhman, Thomas; Klamut, Carl J.; Suenaga, Masaki; and Welch, David, 4,324,842, Cl. 428-614.000.

Weldon, Scott B., to St. Regis Paper Company. Method and apparatus for coating a paper web. 4,324,820, Cl. 427-420.000.

Wellbrock, Werner, to Hoechst Aktiengesellschaft. Process for the continuous preparation of diacetyl ethylene diamine. 4,324,911, Cl. 564-141.000.

Welstead, William J., Jr., to A. H. Robins Company, Inc. Heterocyclic antidiarrheal compositions & methods of use. 4,324,791, Cl. 424-267.000.

Wener, Kenneth R.; and Tinkle, Anthony R., to Marathon Oil Company. Seismic apparatus. 4,324,310, Cl. 181-116.000.

Wengert, Rolf: *See*—
Kobale, Manfred; Lorenz, Hans P.; Weingand, Kaspar; and Wengert, Rolf, 4,325,002, Cl. 313-485.000.

Wenzel, Robert H. Electrical tracer control system utilizing sine wave resolution. 4,325,013, Cl. 318-578.000.

Werkmann, Karl-Heinz, to VDO Adolf Schindling AG. Flowmeter having a rotary body and means for improvement of the starting behavior of the rotary body. 4,324,145, Cl. 73-861.890.

Wernicke, Hans J.; and Schliebener, Claus, to Linde Aktiengesellschaft. Special conditions for the hydrogenation of heavy hydrocarbons. 4,324,935, Cl. 585-314.000.

Wertheim, John H.; and Mishkin, Abraham R., to Societe d'Assistance Technique pour Produits Nestle S.A. Process for preparing freeze dried soluble coffee. 4,324,808, Cl. 426-385.000.

West, Robert C.; and David, Lawrence D., to Wisconsin Alumni Research Foundation. Soluble polysilastyrene and method for preparation. 4,324,901, Cl. 556-430.000.

Western Digital Corporation: *See*—
DeVita, Joseph; and Pirzadeh, Brian, 4,325,118, Cl. 364-200.000.

Western Electric Co., Inc.: *See*—
Bankes, Kristen E.; Large, Donald M.; Reinhard, Fred J.; and Tamashasky, Joseph A., 4,324,600, Cl. 156-64.000.
Ehling, John W., 4,324,515, Cl. 409-300.000.
Taylor, Raymond G., 4,324,954, Cl. 179-90.00B.

Western Geophysical Co. of America: *See*—
Farris, Richard C., 4,324,311, Cl. 181-120.000.

Westinghouse Electric Corp.: *See*—
Cooper, Frank W., Jr.; and Golick, Leonard R., 4,325,026, Cl. 324-232.000.
Gilmore, John F.; and Lopenski, Stanley A., 4,324,998, Cl. 313-318.000.
Hrizo, John; Bauerle, James E.; and Witkowski, Robert E., 4,325,029, Cl. 324-468.000.
Johnson, Frederick O., 4,325,115, Cl. 363-81.000.
Kothmann, Richard E., 4,324,844, Cl. 429-26.000.
Maier, Alfred E.; and Ricci, Louis N., 4,324,963, Cl. 200-318.000.
Ristuccia, Donald J.; and Cotton, John F., 4,324,961, Cl. 200-150.00R.
Taylor, Owen S.; and Broniarek, Czeslaw A., 4,324,997, Cl. 310-248.000.

Weston, Norma A.; and Schurdak, Edward J., to American Cyanamid Company. Encapsulated fluorescent composition. 4,324,682, Cl. 252-301.270.

Weynant, Eric: *See*—
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,324,756, Cl. 264-322.000.

Whirlpool Corporation: *See*—
Sherer, Robert B.; and Weir, Robert M., 4,324,035, Cl. 29-434.000.

White, Ben E.: *See*—
Geyer, Charles J., Jr.; and White, Ben E., 4,324,751, Cl. 264-23.000.

White, Dwain M.; and Keyes, David G., to General Electric Company. Method for making polyetherimide using a phenolic or carboxylic acid catalyst. 4,324,883, Cl. 528-207.000.

White, Dwain M.; and Keyes, David G., to General Electric Company. Organic amine catalyzed method for making polyetherimide. 4,324,884, Cl. 528-207.000.

White, Dwain M.; and Keyes, David G., to General Electric Company. Quaternary Group VA salt catalyzed method for making polyetherimide. 4,324,885, Cl. 528-207.000.

White, Ellis S.; Zatkoff, William C.; Light, John J.; and Michen, Ramon, to Sandmold Systems, Inc. Molten metal pouring device. 4,324,392, Cl. 266-240.000.

White, Kenneth M. Pin type tooth retention system. 4,324,057, Cl. 37-142.00A.

Whitley, George J., to RCA Corporation. Apparatus for automatic adjustment of an inductor in a tuned circuit. 4,325,040, Cl. 334-17.000.

Whitman Medical Corp.: *See*—
Gordon, Marvin; and Lichtenstein, Joseph, 4,324,236, Cl. 128-214.00R.
Gordon, Marvin; and Lichtenstein, Joseph, 4,324,239, Cl. 128-214.00R.

Whitney, Daniel E.: *See*—
Gustavson, Richard E.; Selvage, Craig C.; and Whitney, Daniel E., 4,324,032, Cl. 29-407.000.

Wick, Richard, to AGFA-Gevaert Aktiengesellschaft. Photographic apparatus with automatic focusing means. 4,324,464, Cl. 354-25.000.

Wiczer, Max: *See*—
Sarrafian, Vahram K.; and Kim, Syng N., 4,324,403, Cl. 273-127.00R.

Wiener, Daniel P., to Burroughs Corporation. BCD To binary converter. 4,325,056, Cl. 340-347.0DD.

Wight, David R.: *See*—
Hughes, Brian T.; Redstone, Reuben; Vokes, John C.; and Wight, David R., 4,325,073, Cl. 357-22.000.

Wikswo, John P., Jr.: *See*—
Barach, John P.; and Wikswo, John P., Jr., 4,324,255, Cl. 128-630.000.

Wilcox, David E.; and Allan, Thomas T., to Flanders Filters, Inc. Method and apparatus for the leak testing of filters. 4,324,568, Cl. 55-97.000.

Wilkerson, James W. Capo. 4,324,165, Cl. 84-318.000.

Wilkes, Donald F., to Atlantic Richfield Company. Wheelchair. 4,324,414, Cl. 280-242.0WC.

Will, Fritz G., to General Electric Company. Positive electrode for lead acid battery. 4,324,848, Cl. 429-228.000.

Williams, Richard, to RCA Corporation. Apparatus and method for measuring the rate of evaporation of a liquid. 4,324,132, Cl. 73-61.300.

Williamson, Michael, to Owens-Corning Fiberglas Corporation. Electric glass melting furnace. 4,324,942, Cl. 373-39.000.

Willis, Betty A., to Willis, Charles S., a part interest. Protective headgear. 4,324,005, Cl. 2-413.000.
Willis, Charles S.: *See—*
Willis, Betty A., 4,324,005, Cl. 2-413.000.
Willis, Larry G., to Hamilton Glass Products Incorporsted. Mirror package. 4,324,332, Cl. 206-454.000.
Wilson, Arnold W.: *See—*
Wilson, Charles E.; Wilson, Arnold W.; and Morley, Reginald H., 4,324,429, Cl. 296-100.000.
Wilson, Charles E.; Wilson, Arnold W.; and Morley, Reginald H., to Sunwil Manufacturing Ltd. Quick detachable hinging cover for pickup truck beds. 4,324,429, Cl. 296-100.000.
Wing, Steven D.: *See—*
Rutkowski, Edward J.; Mapes, Carl R.; Wing, Steven D.; and Dawdy, Jack A., 4,324,082, Cl. 52-481.000.
Winkelblech, Dean R. Elevator device. 4,324,317, Cl. 187-25.000.
Wirth, Friedrich: *See—*
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, 4,324,694, Cl. 252-435.000.
Wisconsin Alumni Research Foundation: *See—*
West, Robert C.; and David, Lawrence D., 4,324,901, Cl. 556-430.000.
Wisskirchen, Klaus B.: *See—*
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Wistuba, Eberhard; Lenzer, Xaver; and Mandle, Herbert, to Karl Mengele & Sohne Maschinenfabrik and Eisengiesserei GmbH & Co. Vehicular forage harvester. 4,324,091, Cl. 56-16.600.
Withers, Michael S., to Du Pont de Nemours, E. I., and Company. Process for forming a reinforced membrane. 4,324,606, Cl. 156-272.200.
Witkowski, Robert E.: *See—*
Hrizo, John; Bauerle, James E.; and Witkowski, Robert E., 4,325,029, Cl. 324-468.000.
Witt, Michael A.: *See—*
Cunningham, Frank D.; Witt, Michael A.; and Hill, Robert M., 4,324,195, Cl. 114-312.000.
Wittmann, Alois; and Rubin, Charles P., to Hughes Aircraft Company. Integrated spacecraft and cradle structure. 4,324,374, Cl. 244-158.00R.
Wittmann, Erwin J.: *See—*
Harwood, Leopold A.; and Wittmann, Erwin J., 4,325,076, Cl. 358-31.000.
Woinsky, Samuel G., to Occidental Petroleum Corporation. Process and system for recovery of energy from geothermal brines and other hot water sources. 4,324,102, Cl. 60-641.300.
Wolar, William. Protective means for attachments affixed to electrically operated beds. 4,325,061, Cl. 340-679.000.
Wolf, Gunter: *See—*
Hoppner, Klaus; and Wolf, Gunter, 4,324,045, Cl. 30-381.000.
Wolfe, John E., to Burroughs Corporation. Electron-beam cathode having a uniform emission pattern. 4,324,999, Cl. 313-336.000.
Wolfe, John E.; and Swanson, Lynwood W., to Burroughs Corporation. Low work function cathode. 4,325,000, Cl. 313-336.000.
Wolfrum, Gerhard: *See—*
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,324,722, Cl. 260-207.000.
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,324,723, Cl. 260-207.100.
Wonder Corporation of America, Inc.: *See—*
Schub, Leonard, 4,324,039, Cl. 29-623.100.
Wong, Kenny; and Hall, Wilbur L., to Texaco Inc. Viscous oil recovery method. 4,324,291, Cl. 166-252.000.
Wood, Grant: *See—*
Johnson, Logan; Wood, Grant; and Brofft, Jerry, 4,324,348, Cl. 222-181.000.
Woodliff, Ronald D.; Paape, Kenneth L.; and Johnston, Edwin S., to Allen-Bradley Company. Slip-type conduit hub for enclosures. 4,324,424, Cl. 285-158.000.
Woolslayer, Joseph R., to Lee C. Moore Corporation. Method of moving a drilling rig long and short distances. 4,324,077, Cl. 52-143.000.
Wovkulich, Peter M.: *See—*
Uskokovic, Milan R.; and Wovkulich, Peter M., 4,324,726, Cl. 260-343.600.
Wright, Basil M., to National Research Development Corporation. Body function detection and medical instruments therefor. 4,324,259, Cl. 128-722.000.
Wright, Charles E., to Eastman Technology, Inc. Lap and dissolve in video cameras with VTR. 4,325,088, Cl. 360-14.000.
Wright, Douglas C.; and Roberts, Sidney N., to Inheed Pty Ltd. Spiral separators. 4,324,334, Cl. 209-459.000.
Wright, Leonard F.: *See—*
Senior, Peter J.; Wright, Leonard F.; and Alderson, Barry, 4,324,907, Cl. 560-185.000.
Wrobbel, Edward J. Open end ratchet wrench. 4,324,159, Cl. 81-111.000.
Wu, George, to Velo-Bind, Inc. Punching and binding machine. 4,324,013, Cl. 412-16.000.
Wuebker, Robert A., to General Signal Corporation. Method for substantially cold working nonheat-treatable aluminum alloys. 4,324,596, Cl. 148-11.50A.
Wulff, Bernard J., to Caterpillar Tractor Co. Composite shield-step. 4,324,412, Cl. 280-163.000.
Wulz, Klaus: *See—*
Mueller, Hans; Wulz, Klaus; Beyer, Karl-Heinz; and Streit, Werner, 4,324,724, Cl. 260-239.00E.
Wurmb, Rolf: *See—*
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Xerox Corporation: *See—*
Burnham, Paul W., 4,324,490, Cl. 355-3.0DD.
Gabor, Andrew, 4,324,497, Cl. 400-144.200.
Lu, Chin H.; Sherony, Dominic F.; and Erhardt, Peter F., 4,324,851, Cl. 430-106.000.
Silverberg, Morton, 4,324,395, Cl. 271-98.000.
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Xynetics, Inc.: *See—*
Roch, Jacques L., 4,324,047, Cl. 33-18.00R.
Yamada, Hiroyoshi: *See—*
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Yamada, Sadahiko: *See—*
Harada, Masato; Yamada, Sadahiko; Suzuki, Atsushi; and Masuda, Jun, 4,324,875, Cl. 526-115.000.
Yamada, Takeo: *See—*
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, 4,324,665, Cl. 210-718.000.
Yamaguchi, Hitoshi: *See—*
Naito, Akira; Hayakawa, Toru; Nakanishi, Masakatsu; Ikuta, Sunao; Kajiwara, Shoichiro; and Yamaguchi, Hitoshi, 4,324,784, Cl. 424-130.000.
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, to Tokan Kogyo Kabushiki Kaisha. Easily openable cover member. 4,324,341, Cl. 220-258.000.
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, to Tokan Kogyo Kabushiki Kaisha. Easily openable cover member. 4,324,342, Cl. 220-268.000.
Yamaguchi, Terumoto; and Ohta, Masaya, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Pre-heating assembly to be used for pre-heating ingots. 4,324,391, Cl. 266-200.000.
Yamaguchi, Toshiaki: *See—*
Kubota, Misao; Hanai, Yoshitada; and Yamaguchi, Toshiaki, 4,324,680, Cl. 252-182.100.
Yamaguchi, Toshihiro: *See—*
Kishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, 4,325,064, Cl. 340-753.000.
Yamamoto, Akira: *See—*
Ishihara, Toshinobu; Taguchi, Kenichi; Yamamoto, Akira; Takasaka, Nobuo; Shimizu, Hisashi; and Oshima, Mitsuyoshi, 4,324,931, Cl. 570-189.000.
Yamamoto, Isao: *See—*
Tsuji, Nobuo; Fujiyama, Masaaki; Nakahara, Hiromi; Tadokoro, Eiichi; Tanaka, Keiji; and Yamamoto, Isao, 4,324,177, Cl. 100-155.00R.
Yamamoto, Toru: *See—*
Hatakeyama, Hideo; and Yamamoto, Toru, 4,324,748, Cl. 264-51.000.
Yamashita, Kiyoshi; and Takagi, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Refuse storage apparatus with sealer for sealing pliable bag top. 4,324,088, Cl. 53-527.000.
Yamashita, Thoru: *See—*
Hasegawa, Shoichi; Yamashita, Thoru; and Kameda, Mitsuo, 4,324,764, Cl. 422-159.000.
Yamauchi, Takashi: *See—*
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,324,929, Cl. 570-127.000.
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Yano, Haruto: *See—*
Hara, Takanori; Yoshinaga, Makoto; Yano, Haruto; and Matumura, Noriyasu, 4,324,986, Cl. 307-10.0LS.
Yano, Takefumi: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Tamura, Masanori; and Yuasa, Sakae, 4,324,877, Cl. 526-127.000.
Yasuda, Takashi: *See—*
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,324,783, Cl. 424-114.000.
Yau, Ben J., to Owens-Corning Fiberglas Corporation. Wet process mat binder. 4,324,833, Cl. 428-290.000.
Yazaki Corporation: *See—*
Watanabe, Mitsugu; and Hirano, Tomoyuki, 4,324,449, Cl. 339-91.00R.
Yokomichi, Isao; Yamada, Takeo; Mohri, Akio; Ota, Kiyoshi; and Ikeda, Minoru, to Ishihara Sangyo Kaisha, Ltd.; and Nissan Chemical Industries, Ltd. Process for recovering bromine from waste liquid. 4,324,665, Cl. 210-718.000.
Yokomizo, Hiroshi: *See—*
Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Nakai, Hiromitu, 4,324,850, Cl. 430-24.000.
Yokono, Hitoshi: *See—*
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Yoshida, Atsushi: *See—*
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Yoshikawa, Tsukasa: *See—*
Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,324,341, Cl. 220-258.000.

Yamaguchi, Kisaburo; and Yoshikawa, Tsukasa, 4,324,342, Cl. 220-268.000.

Yoshikazu, Ikeda, to Kokusai Denshin Denwa Co., Ltd. Power supply system to terminal equipment through an optical fiber cable. 4,325,137, Cl. 370-4.000.

Yoshimura, Hirofumi: *See*—
Ikeda, Nobuo; and Yoshimura, Hirofumi, 4,324,967, Cl. 219-10.55F.

Yoshimura, Kazunori: *See*—
Ito, Katsuo; and Yoshimura, Kazunori, 4,325,103, Cl. 361-424.000.

Yoshimura, Toyofusa: *See*—
Oka, Hitoshi; Kikuchi, Hiroshi; Yokono, Hitoshi; Suzuki, Haruo; Yoshimura, Toyofusa; Matsuo, Akira; Miyazawa, Osamu; Tanaka, Isamu; and Isogai, Tokio, 4,324,629, Cl. 204-180.00P.

Yoshinaga, Makoto: *See*—
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Yosnida Kogyo K.K.: *See*—
Ishida, Kinji, 4,324,071, Cl. 49-63.000.

Young, Rodney C.: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,324,789, Cl. 424-251.000.

Youngstown Steel Door Company, The: *See*—
Fritz, William E., 4,324,188, Cl. 105-282.00R.

Yu, Kin C.: *See*—
Grandmaison, John P.; Huettner, Robert E.; Vernon, John H.; and Yu, Kin C., 4,325,119, Cl. 364-200.000.

Yuasa, Sakae: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Tamura, Masanori; and Yuasa, Sakae, 4,324,877, Cl. 526-127.000.

Yun, Bob H.: *See*—
Corcoran, Richard A.; Keenan, William A.; Michaelides, Demetrios; and Yun, Bob H., 4,325,025, Cl. 324-158.00R.

Zablocky, William J. System for handling tubular containers, including apparatus and cases therefor. 4,324,523, Cl. 414-131.000.

Zabotto, Arlette: *See*—
Koulbanis, Constantin; Millet, Catherine; Zabotto, Arlette; and Brun, Alain, 4,324,802, Cl. 424-364.000.

Zachev, Ivan: *See*—
Wagner, William E.; and Zachev, Ivan, 4,325,058, Cl. 340-562.000.

Zaghi, Hooshmand; and Tisone, Thomas C., to Gould Inc. Deformable flexure element for strain gage transducer and method of manufacture. 4,325,048, Cl. 338-3.000.

Zatkoff, William C.: *See*—
White, Ellis S.; Zatkoff, William C.; Light, John J.; and Michen, Ramon, 4,324,392, Cl. 266-240.000.

Zibritosky, George, to PPG Industries, Inc. Method and apparatus for add-on reinforcement for transparency system for crew module for aircraft. 4,324,373, Cl. 244-121.000.

Zimmer, Inc.: *See*—
Ignasiak, Michael J., 4,324,331, Cl. 206-363.000.

Zirconal Processes Limited: *See*—
Davis, Richard P. B.; Emblem, Harold G.; Shaw, Richard D.; and Shelley, Stanley J., 4,324,602, Cl. 156-71.000.

Zirnite, Richard N.: *See*—
Beede, Charles H.; and Zirnite, Richard N., 4,324,591, Cl. 106-85.000.

Zirwick, Kurt, to Rohde & Schwarz GmbH & Co KG. Device for inspecting an individual high frequency signal selected according to frequency from a broad frequency band. 4,325,023, Cl. 324-77.00B.

Zollo, Corrado: *See*—
Landis, Newton C. M.; and Zollo, Corrado, 4,324,816, Cl. 427-128.000.

Zondler, Helmut; and Moser, Roland, to Ciba-Geigy Corporation. Dimethylamino derivatives and their use. 4,324,739, Cl. 260-465.400.

Zscheile, John W., Jr., to Sperry Corporation. Continuous wave adaptive signal processor system. 4,325,138, Cl. 375-1.000.

Zubriski, David S.: *See*—
Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., 4,324,548, Cl. 433-126.000.

Zysk, Edward D.; and Stephans, Robert, to Engelhard Corporation. Arc erosion resistant composite materials and processes for their manufacture. 4,324,588, Cl. 75-208.00R

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF APRIL, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Boxrud, Phillip E., to Outboard Marine Corporation. Soil sampling device. Re. 30,901, Cl. 73-864.310.

Elevator Equipment Co.: *See*—
Lawrence, William A. P.; and Whelchel, Robert J., Re. 30,902, Cl. 137-625.390.

Gerber, Mark S.: *See*—
Miller, Don W.; and Gerber, Mark S., Re. 30,904, Cl. 250-370.000.

Graphic Scanning, Inc.: *See*—
Vicari, Ronald P.; and Yampol, Barry, Re. 30,903, Cl. 179-27.0FH.

Kallman, Robert A. Accessory holder for use on article of clothing. Re. 30,899, Cl. 24-3.00C.

Lawrence, William A. P.; and Whelchel, Robert J., to Elevator Equipment Co. Pressure and temperature compensating hydraulic valve. Re. 30,902, Cl. 137-625.390.

Miller, Don W.; and Gerber, Mark S., to Ohio State University, The. Control system for gamma camera. Re. 30,904, Cl. 250-370.000.

Ohio State University, The: *See*—
Miller, Don W.; and Gerber, Mark S., Re. 30,904, Cl. 250-370.000.

Outboard Marine Corporation: *See*—
Boxrud, Phillip E., Re. 30,901, Cl. 73-864.310.

Shih, Hsing-Hua, to Westinghouse Electric Corp. Fluid current meter. Re. 30,900, Cl. 73-189.000.

Vicari, Ronald P.; and Yampol, Barry, to Graphic Scanning, Inc. Computer controlled telephone answering system. Re. 30,903, Cl. 179-27.0FH.

Westinghouse Electric Corp.: *See*—
Shih, Hsing-Hua, Re. 30,900, Cl. 73-189.000.

Whelchel, Robert J.: *See*—
Lawrence, William A. P.; and Whelchel, Robert J., Re. 30,902, Cl. 137-625.390.

Yampol, Barry: *See*—
Vicari, Ronald P.; and Yampol, Barry, Re. 30,903, Cl. 179-27.0FH.

LIST OF DESIGN PATENTEES

AB Dentatus: *See*—
Edwardson, Svante R., 263,878, Cl. D24-16.000.

AB Jarnarmatur: *See*—
Pettersson, Dan A. B., 263,781, Cl. D32-66.000.

Abbott Laboratories: *See*—
Genese, Joseph N., 263,873, Cl. D24-54.000.
Genese, Joseph N., 263,874, Cl. D24-54.000.
Genese, Joseph N., 263,875, Cl. D24-54.000.

Action Industries, Inc.: *See*—
Keller, Nicholas W., 263,773, Cl. D6-153.000.

AGFA-Gevaert AG: *See*—
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,845, Cl. D16-5.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,846, Cl. D16-1.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,847, Cl. D16-1.000.

Ahrens, John E., to C. Schmidt Company, The. Combined refrigerator door and frame unit. 263,835, 4-13-82, Cl. D15-91.000.

Allibert Exploitation: *See*—
Deconinck, Didier, 263,774, Cl. D6-146.000.

Alpert, Alan, to Tree Time, Inc. Mirror. 263,772, 4-13-82, Cl. D6-244.000.

Alton Box Board Company: *See*—
Magee, Guion C., 263,793, Cl. D9-433.000.

American Cyanamid Company: *See*—
Grip, John A., 263,806, Cl. D9-370.000.

American Home Products Corporation: *See*—
Francis, Stephen A., 263,880, Cl. D24-17.000.

Angleman, John D.; and du Cret, Doris, to Bristol-Myers Company. Packaging container. 263,800, 4-13-82, Cl. D9-332.000.

Aqua-Leisure Industries, Inc.: *See*—
Fireman, Simon C., 263,796, Cl. D9-418.000.

Ashley, Ward R., to Vision Group, The. Perforated drain cover. 263,776, 4-13-82, Cl. D6-86.000.

Automatic Liquid Packaging, Inc.: *See*—
Pagels, Louis T., 263,795, Cl. D9-370.000.

Bachmann, G. Merle; Burrous, Homer C.; and Shelton, Walter L., to Coca-Cola Company, The. Display panel for a vending machine. 263,855, 4-13-82, Cl. D20-8.000.

Baranowski, Frank, Jr. Double-barrel gas torch. 263,790, 4-13-82, Cl. D8-30.000.

Barber, Herbert L. Container for enclosing a board game. 263,861, 4-13-82, Cl. D21-15.000.

Barbera, Lawrence E.; Connin, John L.; Lawing, Michael E.; and Richardson, Dean W., to Exxon Research & Engineering Co. Facsimile transceiver or similar article. 263,831, 4-13-82, Cl. D14-94.000.

Beatrice Foods Co.: *See*—
Chow, Ho; and Uyeda, Tim M., 263,868, Cl. D23-7.000.

Beauchamp, Roger P., to International Packaging Corp. Display box. 263,797, 4-13-82, Cl. D9-424.000.

Bechtold. Paul E. Mobile. 263,814, 4-13-82, Cl. D11-141.000.

Beidler, Glenn S.; Johnson, Leighton C.; and Kheiri, Mohammad A., to Miles Laboratories, Inc. Reagent cassette. 263,876, 4-13-82, Cl. D24-29.000.

Bell Telephone Laboratories, Incorporated: *See*—
Hagelbarger, David W.; and Kubik, Peter S., 263,824, Cl. D14-54.000.

Birch, Walter F., to Denroy Plastics Limited. Hairbrush. 263,768, 4-13-82, Cl. D4-35.000.

Blake, Marc B.: *See*—
Sogoian, Tig; and Blake, Marc B., 263,767, Cl. D2-400.000.

Blaszkowski, Henry. Combined soap bar and holder. 263,885, 4-13-82, Cl. D28-8.100.

Bristol-Myers Company: *See*—
Angleman, John D.; and du Cret, Doris, 263,800, Cl. D9-332.000.

Burrous, Homer C.: *See*—
Bachmann, G. Merle; Burrous, Homer C.; and Shelton, Walter L., 263,855, Cl. D20-8.000.

Buschmann, Sylvester. Artifact holding locket. 263,813, 4-13-82, Cl. D11-83.000.

Butler, Lawrence G.; and Means, Dorthea. Combined coaster and ash tray holder. 263,784, 4-13-82, Cl. D7-71.000.

C. Schmidt Company, The: *See*—
Ahrens, John E., 263,835, Cl. D15-91.000.

Calvert, James T. Decal. 263,854, 4-13-82, Cl. D20-11.000.

Canon Kabushiki Kaisha: *See*—
Sakurai, Mitsuru, 263,844, Cl. D16-30.000.

Chapman, Robert B. Loudspeaker housing or similar article. 263,823, 4-13-82, Cl. D14-34.000.

Chow, Ho; and Uyeda, Tim M., to Beatrice Foods Co. Water sprinkler base. 263,868, 4-13-82, Cl. D23-7.000.

Coca-Cola Company, The: *See*—
Bachmann, G. Merle; Burrous, Homer C.; and Shelton, Walter L., 263,855, Cl. D20-8.000.

Cole, David R.: *See*—
Hildebrand, Robert A.; and Cole, David R., 263,780, Cl. D6-24.000.

Cole, Russell P. Hand surf board. 263,860, 4-13-82, Cl. D21-228.000.

Connin, John L.: *See*—
Barbera, Lawrence E.; Connin, John L.; Lawing, Michael E.; and Richardson, Dean W., 263,831, Cl. D14-94.000.

Dahan, Sion. Jewelry pendant. 263,816, 4-13-82, Cl. D11-81.000.

Dallaire, Raymond. Window component extrusion. 263,882, 4-13-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,883, 4-13-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,884, 4-13-82, Cl. D25-74.000.

Deconinck, Didier, to Allibert Exploitation. Table or similar article. 263,774, 4-13-82, Cl. D6-146.000.

Denroy Plastics Limited: *See*—
Birch, Walter F., 263,768, Cl. D4-35.000.

Dillon, Richard L. Stove. 263,864, 4-13-82, Cl. D23-97.000.

D'Onofrio, Anthony: *See—*
Hochstrate, Paul; and D'Onofrio, Anthony, 263,811, Cl. D10-123.000.
Drutz, Alvin S.: *See—*
McKinnon, Eugene T.; and Drutz, Alvin S., 263,788, Cl. D8-394.000.
DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Copying and sorting apparatus. 263,848, 4-13-82, Cl. D16-31.000.
DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Continuous form feeding and copying apparatus. 263,850, 4-13-82, Cl. D16-31.000.
du Cret, Doris: *See—*
Angleman, John D.; and du Cret, Doris, 263,800, Cl. D9-332.000.
E-Z-EM Company, Inc.: *See—*
Greene, Franklin R., 263,870, Cl. D24-56.000.
Edwah Electronics Limited: *See—*
Lee, Kwong C., 263,832, Cl. D14-73.000.
Edwards, Richard T., to Genpak Corporation. Food container. 263,798, 4-13-82, Cl. D9-426.000.
Edwardson, Svante R., to AB Dentatus. Root canal screw. 263,878, 4-13-82, Cl. D24-16.000.
Engelhardt, Philip L., to S. Engelhardt & Co. Cuff link with centerpiece. 263,765, 4-13-82, Cl. D2-422.000.
Englishtown Sportswear Ltd.: *See—*
Heinfling, Martin, 263,766, Cl. D2-28.000.
Euwema, George J.; and Euwema, George W. Table attachable seat for a child. 263,769, 4-13-82, Cl. D6-9.000.
Euwema, George W.: *See—*
Euwema, George J.; and Euwema, George W., 263,769, Cl. D6-9.000.
Exxon Research & Engineering Co.: *See—*
Barbera, Lawrence E.; Connin, John L.; Lawing, Michael E.; and Richardson, Dean W., 263,831, Cl. D14-94.000.
F. T. Read & Sons, Inc.: *See—*
Read, James L., 263,836, Cl. D15-147.000.
Fireman, Simon C., to Aqua-Leisure Industries, Inc. Combined packaging and display box. 263,796, 4-13-82, Cl. D9-418.000.
Fleit & Jacobson: *See—*
Gallub, Thomas M., 263,852, Cl. D18-24.000.
Francis, Stephen A., to American Home Products Corporation. Obstetrical telemetry instrument enclosure. 263,880, 4-13-82, Cl. D24-17.000.
Fraze, Ermal C. End closure for a container. 263,802, 4-13-82, Cl. D9-438.000.
Fraze, Ermal C. End closure for a container. 263,803, 4-13-82, Cl. D9-438.000.
Frieberg, Bengt O. Lock washer. 263,791, 4-13-82, Cl. D8-399.000.
Frieberg, Bengt O. Lock washer. 263,792, 4-13-82, Cl. D8-399.000.
Fuerneisen, Thomas J., to Microtime, Incorporated. Adhesively mounted timepiece. 263,812, 4-13-82, Cl. D10-15.000.
Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Microphone for a vehicular telephone set or similar article. 263,830, 4-13-82, Cl. D14-12.000.
Gallub, Thomas M., to Fleit & Jacobson. Position Marker. 263,852, 4-13-82, Cl. D18-24.000.
Genese, Joseph N., to Abbott Laboratories. Flexible stylet. 263,873, 4-13-82, Cl. D24-54.000.
Genese, Joseph N., to Abbott Laboratories. Flexible stylet. 263,874, 4-13-82, Cl. D24-54.000.
Genese, Joseph N., to Abbott Laboratories. Flexible stylet. 263,875, 4-13-82, Cl. D24-54.000.
Genpak Corporation: *See—*
Edwards, Richard T., 263,798, Cl. D9-426.000.
Golab, Richard J. Game bat. 263,863, 4-13-82, Cl. D21-211.000.
Gradco/Dendoki, Inc.: *See—*
DuBois, R. Clark; and Hamma, John C., 263,848, Cl. D16-31.000.
DuBois, R. Clark; and Hamma, John C., 263,850, Cl. D16-31.000.
Lawrence, Frederick J., 263,849, Cl. D16-31.000.
Greene, Franklin R., to E-Z-EM Company, Inc. Flexible container for barium radiological examinations. 263,870, 4-13-82, Cl. D24-56.000.
Grip, John A., to American Cyanamid Company. Combined bottle and cap. 263,806, 4-13-82, Cl. D9-370.000.
Hagelbarger, David W.; and Kubik, Peter S., to Bell Telephone Laboratories, Incorporated. General-purpose electronic telephone set base. 263,824, 4-13-82, Cl. D14-54.000.
Hamma, John C.: *See—*
DuBois, R. Clark; and Hamma, John C., 263,848, Cl. D16-31.000.
DuBois, R. Clark; and Hamma, John C., 263,850, Cl. D16-31.000.
Hatchell, Ray A. Combined wrench and anvil. 263,789, 4-13-82, Cl. D8-26.000.
Hayashi, Juhei; and Tabata, Koichi, to Sony Corporation. Video tape recorder. 263,834, 4-13-82, Cl. D14-2.000.
Heinfling, Martin, to Englishtown Sportswear Ltd. Pocket for jeans or the like. 263,766, 4-13-82, Cl. D2-28.000.
Hildebrand, Robert A.; and Cole, David R. Stand for supporting skis and poles. 263,780, 4-13-82, Cl. D6-24.000.
Hirooka, Junji: *See—*
Fukushima, Hisao; and Hirooka, Junji, 263,830, Cl. D14-12.000.
Hochstrate, Paul; and D'Onofrio, Anthony, to Timex Corporation. Electrooptic timepiece face design. 263,811, 4-13-82, Cl. D10-123.000.
Honjo, Hiroshi, to Sony Corporation. Video disk player. 263,829, 4-13-82, Cl. D14-1.000.
Honjo, Hiroshi, to Sony Corporation. Video disk player. 263,833, 4-13-82, Cl. D14-1.000.
Hopper, Glenn A. Shower stool. 263,775, 4-13-82, Cl. D6-32.000.
IDR Electronics Co., Ltd.: *See—*
Sumiyasu, Noriaki, 263,869, Cl. D24-99.000.
International Packaging Corp.: *See—*
Beauchamp, Roger P., 263,797, Cl. D9-424.000.
Inverness International: *See—*
Mann, Samuel J., 263,879, Cl. D24-26.000.
Itakura, Hitoshi, to Tomy Kogyo Co., Inc. Electronic missile game housing. 263,859, 4-13-82, Cl. D21-13.000.
Jackson, Frederick P.; and Newell, Brian, to Prestige Group Limited, The. Pressure cooker. 263,782, 4-13-82, Cl. D7-86.000.
Jefsteel Business Equipment Corp.: *See—*
Levenberg, Alvin T., 263,820, Cl. D34-23.000.
John McIlwraith Industries Ltd.: *See—*
Jury, William L., 263,881, Cl. D92-26.000.
Jury, William L., 263,887, Cl. D92-26.000.
Jury, William L., 263,888, Cl. D92-26.000.
Johnson, Leighton C.: *See—*
Beidler, Glenn S.; Johnson, Leighton C.; and Kheiri, Mohammad A., 263,876, Cl. D24-29.000.
Jury, William L., to John McIlwraith Industries Ltd. Expanded panel of extruded metal. 263,881, 4-13-82, Cl. D92-26.000.
Jury, William L., to John McIlwraith Industries Ltd. Expanded panel of extruded metal. 263,887, 4-13-82, Cl. D92-26.000.
Jury, William L., to John McIlwraith Industries Ltd. Expanded panel of extruded metal. 263,888, 4-13-82, Cl. D92-26.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Tanaka, Kiyoaki, 263,808, Cl. D10-124.000.
Kabushikigaisha OMCO: *See—*
Okazaki, Yasukichi; and Okazaki, Tatsuo, 263,783, Cl. D7-62.000.
Kao Soap Co., Ltd.: *See—*
Kondo, Yukio; and Numata, Kurima, 263,804, Cl. D9-413.000.
Kaplus, Robert J.; and Marchetti, Vincent. Notched grill for a van window. 263,819, 4-13-82, Cl. D12-183.000.
Keller, Nicholas W., to Action Industries, Inc. Magazine rack. 263,773, 4-13-82, Cl. D6-153.000.
Kheiri, Mohammad A.: *See—*
Beidler, Glenn S.; Johnson, Leighton C.; and Kheiri, Mohammad A., 263,876, Cl. D24-29.000.
Kidde, Inc.: *See—*
Lippisch, George G., 263,889, Cl. D99-28.000.
King Seeley Thermos Co.: *See—*
Seager, Richard H., 263,805, Cl. D9-450.000.
Kingsford, Ted I., to Plough, Inc. Cosmetic container. 263,807, 4-13-82, Cl. D9-353.000.
Kohan, Vivian J. Taco shell holder. 263,786, 4-13-82, Cl. D7-105.000.
Kondo, Yukio; and Numata, Kurima, to Kao Soap Co., Ltd. Bottle. 263,804, 4-13-82, Cl. D9-413.000.
Kubik, Peter S.: *See—*
Hagelbarger, David W.; and Kubik, Peter S., 263,824, Cl. D14-54.000.
Kurozumi, Shigeru, to Sharp Corporation. Electronic translator. 263,853, 4-13-82, Cl. D18-7.000.
Lawing, Michael E.: *See—*
Barbera, Lawrence E.; Connin, John L.; Lawing, Michael E.; and Richardson, Dean W., 263,831, Cl. D14-94.000.
Lawrence, Frederick J., to Gradco/Dendoki, Inc. Copying and sorting apparatus. 263,849, 4-13-82, Cl. D16-31.000.
Lear Siegler, Inc.: *See—*
Pareja, Ramon, 263,843, Cl. D15-7.000.
Lee, Kwong C., to Edwah Electronics Limited. Clock radio. 263,832, 4-13-82, Cl. D14-73.000.
Lemberger, David. Packing insert or similar article. 263,801, 4-13-82, Cl. D9-456.000.
Levenberg, Alvin T., to Jefsteel Business Equipment Corp. Business forms dolly. 263,820, 4-13-82, Cl. D34-23.000.
Lippisch, George G., to Kidde, Inc. Customer financial transaction terminal for drive-up banking and the like. 263,889, 4-13-82, Cl. D99-28.000.
Magee, Guion C., to Alton Box Board Company. Food carton. 263,793, 4-13-82, Cl. D9-433.000.
Mann, Samuel J., to Inverness International. Electrolysis hair removal kit. 263,879, 4-13-82, Cl. D24-26.000.
Marchetti, Vincent: *See—*
Kaplus, Robert J.; and Marchetti, Vincent, 263,819, Cl. D12-183.000.
Matsuura, Iwao, to Nissho Corporation. Medical multiport valve cock. 263,871, 4-13-82, Cl. D24-53.000.
Mayuzumi, Masaki, to Tomy Kogyo Co., Inc. Pocket size game box having rotating striking member. 263,862, 4-13-82, Cl. D21-9.000.
McKinnon, Eugene T.; and Drutz, Alvin S. Universal mounting bracket. 263,788, 4-13-82, Cl. D8-394.000.
Means, Dorthea: *See—*
Butler, Lawrence G.; and Means, Dorthea, 263,784, Cl. D7-71.000.
Melchior, Merle C., to Pacific Furniture Manufacturing Co. Seat. 263,770, 4-13-82, Cl. D6-71.000.
Messenger, Ronald L. Fitting for syphoning fuel. 263,866, 4-13-82, Cl. D23-27.000.
Microtime, Incorporated: *See—*
Fuerneisen, Thomas J., 263,812, Cl. D10-15.000.
Miles Laboratories, Inc.: *See—*
Beidler, Glenn S.; Johnson, Leighton C.; and Kheiri, Mohammad A., 263,876, Cl. D24-29.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Suwa, Hiroaki; and Nakata, Kiyohiro, 263,809, Cl. D10-73.000.

Moss, Charles W. Tent for use with truck or the like. 263,857, 4-13-82, Cl. D21-253.000.

Nakata, Kiyohiro: *See—*
Suwa, Hiroaki; and Nakata, Kiyohiro, 263,809, Cl. D10-73.000.

Newell, Brian: *See—*
Jackson, Frederick P.; and Newell, Brian, 263,782, Cl. D7-86.000.

Ngai, Mun H. Speed controller for toy car or the like. 263,858, 4-13-82, Cl. D21-141.000.

Nilsson, Erling I., to Tetra Pak Developpement SA. Cap for container or similar article. 263,799, 4-13-82, Cl. D9-439.000.

Nissho Corporation: *See—*
Matsuura, Iwao, 263,871, Cl. D24-53.000.

North American Philips Corp.: *See—*
Rakocy, William J.; and Rauch, Howard L., 263,872, Cl. D24-41.000.

Numata, Kurima: *See—*
Kondo, Yukio; and Numata, Kurima, 263,804, Cl. D9-413.000.

Okazaki, Tatsuo: *See—*
Okazaki, Yasukichi; and Okazaki, Tatsuo, 263,783, Cl. D7-62.000.

Okazaki, Yasukichi; and Okazaki, Tatsuo, to Kabushikigaisha OMCO. Electric beverage maker. 263,783, 4-13-82, Cl. D7-62.000.

Oki Electric Industry Co., Ltd.: *See—*
Fukushima, Hisao; and Hirooka, Junji, 263,830, Cl. D14-12.000.

Ornatek, Larry B. Pennant. 263,815, 4-13-82, Cl. D11-166.000.

Pacific Furniture Manufacturing Co.: *See—*
Melchior, Merle C., 263,770, Cl. D6-71.000.

Pagels, Louis T., to Automatic Liquid Packaging, Inc. Bottle. 263,795, 4-13-82, Cl. D9-370.000.

Paramount Pictures Corporation: *See—*
Probert, Andrew G., 263,856, Cl. D21-87.000.

Pareja, Ramon, to Lear Siegler, Inc. Piston pump. 263,843, 4-13-82, Cl. D15-7.000.

Pearman, Fred E., Jr., to Singer Company, The. Supply tank for use with a carpet cleaning machine. 263,842, 4-13-82, Cl. D32-23.000.

Pemberton, John H. Computer keyboard. 263,827, 4-13-82, Cl. D14-100.000.

Pemberton, John H. Printout terminal for computer. 263,828, 4-13-82, Cl. D14-111.000.

Pettersson, Dan A. B., to AB Jarnarmatur. Foldable ironing-board. 263,781, 4-13-82, Cl. D32-66.000.

Phillips, Gary J. Solar cooking apparatus. 263,785, 4-13-82, Cl. D7-107.000.

Plough, Inc.: *See—*
Kingsford, Ted I., 263,807, Cl. D9-353.000.

Podszus, Werner; and Schoeller, Peter, to Siemens Aktiengesellschaft. Dental handpiece or similar article. 263,877, 4-13-82, Cl. D24-12.000.

Porter, Charles L. Mobile home. 263,818, 4-13-82, Cl. D12-103.000.

Prestige Group Limited, The: *See—*
Jackson, Frederick P.; and Newell, Brian, 263,782, Cl. D7-86.000.

Probert, Andrew G., to Paramount Pictures Corporation. Toy spaceship. 263,856, 4-13-82, Cl. D21-87.000.

Rakocy, William J.; and Rauch, Howard L., to North American Philips Corp. Housing for a massager/vibrator. 263,872, 4-13-82, Cl. D24-41.000.

Rauch, Howard L.: *See—*
Rakocy, William J.; and Rauch, Howard L., 263,872, Cl. D24-41.000.

Read, James L., to F. T. Read & Sons, Inc. Portable screening plant. 263,836, 4-13-82, Cl. D15-147.000.

Richardson, Dean W.: *See—*
Barbera, Lawrence E.; Connin, John L.; Lawing, Michael E.; and Richardson, Dean W., 263,831, Cl. D14-94.000.

Richins, Robert T., to Waremart, Inc. Combined multiple position checkstand and control cabinet assembly. 263,771, 4-13-82, Cl. D6-143.000.

Rinaldi, Joseph A., to Rival Manufacturing Company. Food slicer in the storage position. 263,840, 4-13-82, Cl. D15-97.000.

Rinaldi, Joseph A. Food slicer in the operational position. 263,841, 4-13-82, Cl. D15-97.000.

Rival Manufacturing Company: *See—*
Rinaldi, Joseph A., 263,840, Cl. D15-97.000.

Rubner, Karlheinz: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,845, Cl. D16-5.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,846, Cl. D16-1.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,847, Cl. D16-1.000.

S. Engelhardt & Co.: *See—*
Engelhardt, Philip L., 263,765, Cl. D2-422.000.

Sakurai, Mitsuru, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 263,844, 4-13-82, Cl. D16-30.000.

Scarpias, Peter. Novelty statuette. 263,817, 4-13-82, Cl. D11-157.000.

Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, to AGFA-Gevaert AG. Photographic camera. 263,845, 4-13-82, Cl. D16-5.000.

Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, to AGFA-Gevaert AG. Photographic camera. 263,846, 4-13-82, Cl. D16-1.000.

Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, to Agfa-Gevaert AG. Photographic camera. 263,847, 4-13-82, Cl. D16-1.000.

Schoeller, Peter: *See—*
Podszus, Werner; and Schoeller, Peter, 263,877, Cl. D24-12.000.

Schultes, Herbert: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,845, Cl. D16-5.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,846, Cl. D16-1.000.
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,847, Cl. D16-1.000.

Seager, Richard H., to King Seeley Thermos Co. Dispensing closure for a container. 263,805, 4-13-82, Cl. D9-450.000.

Sharp Corporation: *See—*
Kurozumi, Shigeru, 263,853, Cl. D18-7.000.

Shelton, Walter L.: *See—*
Bachmann, G. Merle; Burrous, Homer C.; and Shelton, Walter L., 263,855, Cl. D20-8.000.

Shinshu Seiki Kabushiki Kaisha: *See—*
Tanaka, Kiyoaki, 263,808, Cl. D10-124.000.

Siemens Aktiengesellschaft: *See—*
Podszus, Werner; and Schoeller, Peter, 263,877, Cl. D24-12.000.

Singer Company, The: *See—*
Pearman, Fred E., Jr., 263,842, Cl. D32-23.000.

Smith, Thomas J., to TII Industries, Inc. Power line protector or the like. 263,821, 4-13-82, Cl. D13-41.000.

Smith, Thomas J., to TII Industries, Inc. Power line protector or the like. 263,822, 4-13-82, Cl. D13-41.000.

Snyder, Tamara L. Timepiece face. 263,810, 4-13-82, Cl. D10-126.000.

Sogoian, Tig; and Blake, Marc B. Holder for a chewing tobacco pouch or the like. 263,767, 4-13-82, Cl. D2-400.000.

Soltsick, John E., Jr. Styling comb. 263,886, 4-13-82, Cl. D28-21.000.

Somme, Sigurd M. Pump. 263,839, 4-13-82, Cl. D15-7.000.

Sony Corporation: *See—*
Hayashi, Juhei; and Tabata, Koichi, 263,834, Cl. D14-2.000.
Honjo, Hiroshi, 263,829, Cl. D14-1.000.
Honjo, Hiroshi, 263,833, Cl. D14-1.000.

Speakman, John C., to U.S. Philips Corporation. Video cassette recorder. 263,825, 4-13-82, Cl. D14-02.000.

Sumiyasu, Noriaki, to IDR Electronics Co., Ltd. Medical magnetic band. 263,869, 4-13-82, Cl. D24-99.000.

Suwa, Hiroaki; and Nakata, Kiyohiro, to Mitutoyo Mfg. Co., Ltd. Micrometer. 263,809, 4-13-82, Cl. D10-73.000.

Tabata, Koichi: *See—*
Hayashi, Juhei; and Tabata, Koichi, 263,834, Cl. D14-2.000.

Tanaka, Kiyoaki, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Display panel for a digital timepiece. 263,808, 4-13-82, Cl. D10-124.000.

TDK Electronics Co., Ltd.: *See—*
Yoshizawa, Keiichi, 263,794, Cl. D9-432.000.

Testa, Arnold M.: *See—*
Testa, Mario; and Testa, Arnold M., 263,787, Cl. D8-74.000.

Testa, Mario; and Testa, Arnold M. Pipe-holding vise jaw appliance. 263,787, 4-13-82, Cl. D8-74.000.

Tetra Pak Developpement SA: *See—*
Nilsson, Erling I., 263,799, Cl. D9-439.000.

Thompson, Bruce R., to UPL Group Limited. Drawer unit. 263,777, 4-13-82, Cl. D6-129.000.

Thompson, Bruce R., to UPL Group Limited. Bathroom hook. 263,778, 4-13-82, Cl. D6-120.000.

Thompson, Bruce R., to UPL Group Limited. Shower head. 263,867, 4-13-82, Cl. D23-35.000.

Thurston, Brian D. Record clamp. 263,826, 4-13-82, Cl. D14-25.000.

TII Industries, Inc.: *See—*
Smith, Thomas J., 263,821, Cl. D13-41.000.
Smith, Thomas J., 263,822, Cl. D13-41.000.

Timex Corporation: *See—*
Hochstrate, Paul; and D'Onofrio, Anthony, 263,811, Cl. D10-123.000.

Tomy Kogyo Co., Inc.: *See—*
Itakura, Hitoshi, 263,859, Cl. D21-13.000.
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Alpert, Alan, 263,772, Cl. D6-244.000.

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Thompson, Bruce R., 263,778, Cl. D6-120.000.
Thompson, Bruce R., 263,867, Cl. D23-35.000.

Uyeda, Tim M.: *See—*
Chow, Ho; and Uyeda, Tim M., 263,868, Cl. D23-7.000.

Valli & Colombo S.p.A.: *See—*
Valli, Pasquale, 263,779, Cl. D6-120.000.

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Villyard, Charles S. Plastic pipe heat fusion tool. 263,838, 4-13-82, Cl. D15-144.000.

Vision Group, The: *See—*
Ashley, Ward R., 263,776, Cl. D6-86.000.

Waremart, Inc.: *See*—
Richins, Robert T., 263,771, Cl. D6-143.000.

Yamin, Amilcar F. Shower head. 263,865, 4-13-82, Cl. D23-35.000.
Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Case for a magnetic tape magazine. 263,794, 4-13-82, Cl. D9-432.000.

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TO WHOM
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Berman, Herbert L., to Hoermann Corporation U.S.A., Infrared intrusion detector system. B1 3,703,718, Cl. 340-567.

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CLASSIFICATION OF PATENTS

ISSUED APRIL 13, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	4,324,003
131	4,324,004
413	4,324,005

CLASS 3

1.912	4,324,006

CLASS 4

321	4,324,007
445	4,324,008
492	4,324,009

CLASS 5

C8	4,324,010
248	4,324,011
432	4,324,012

CLASS 8

407	4,324,553
561	4,324,554

CLASS 15

4	4,324,014
49 C	4,324,015
119 A	4,324,016
198	4,324,017
236 R	4,324,018
250.32	4,324,019

CLASS 17

51	4,324,020

CLASS 19

159 R	4,324,021

CLASS 23

230 B	4,324,556
230 EP	4,324,555
232 R	4,324,557
	4,324,558

CLASS 24

3 C	Re.30,899
68 CD	4,324,022
	4,324,023
170	4,324,024
261 R	4,324,025

CLASS 27

1	4,324,026

CLASS 29

33 P	4,324,027
157.3 C	4,324,028
239	4,324,029
240	4,324,030
243.58	4,324,031
407	4,324,032
408	4,324,033
410	4,324,034
434	4,324,035
437	4,324,036
469	4,324,037
571	4,324,038
623.1	4,324,039
829	4,324,040

CLASS 30

47	4,324,041
170	4,324,042
276	4,324,043
294	4,324,044
381	4,324,045

CLASS 33

17 A	4,324,046
18 R	4,324,047
180 R	4,324,048
199 B	4,324,049
488	4,324,050

CLASS 34

20	4,324,051
27	4,324,052
236	4,324,053

CLASS 36

137	4,324,054

CLASS 37

42 VL	4,324,055
94	4,324,056
142 A	4,324,057

CLASS 40

310	4,324,058
416	4,324,059

CLASS 42

84	4,324,060

CLASS 43

4.5	4,324,061
110	4,324,062

CLASS 44

1 G	4,324,562
1 SR	4,324,559
	4,324,560
10 E	4,324,561

CLASS 46

44	4,324,063
81	4,324,064
120	4,324,065
165	4,324,066

CLASS 47

1.4	4,324,067
	4,324,068
62	4,324,069
81	4,324,070

CLASS 48

62 R	4,324,563

CLASS 49

63	4,324,071
129	4,324,072

CLASS 51

281 R	4,324,073

CLASS 52

2	4,324,074
	4,324,075
27	4,324,076
143	4,324,077
221	4,324,078
255	4,324,079
309.12	4,324,080
432	4,324,081
481	4,324,082
650	4,324,083
744	4,324,084

CLASS 53

48	4,324,085
134	4,324,086
241	4,324,087
527	4,324,088

CLASS 54

24	4,324,089
44	4,324,090

CLASS 55

20	4,324,564
23	4,324,565
28	4,324,566
43	4,324,567
97	4,324,568
182	4,324,569
267	4,324,570
302	4,324,571
385 R	4,324,572
396	4,324,573
487	4,324,574

CLASS 56

16.6	4,324,091
298	4,324,092
377	4,324,093

CLASS 57

267	4,324,094
327	4,324,095

CLASS 60

200 R	4,324,096
293	4,324,097
420	4,324,098
497	4,324,099
545	4,324,100
562	4,324,101
641.3	4,324,102
663	4,324,103

CLASS 62

77	4,324,104
196 A	4,324,105
197	4,324,106
268	4,324,107
345	4,324,108
353	4,324,109
381	4,324,110
457	4,324,111
511	4,324,112

CLASS 64

7	4,324,113
17 A	4,324,114

CLASS 65

3.11	4,324,575
26	4,324,576

CLASS 66

75.2	4,324,115

CLASS 68

158	4,324,116
205 R	4,324,117

CLASS 69

6.5	4,324,118

CLASS 70

233	4,324,119
312	4,324,120
459	4,324,121

CLASS 71

33	4,324,577
67	4,324,578
74	4,324,579
118	4,324,580
126	4,324,581

CLASS 72

41	4,324,122
345	4,324,124
479	4,324,125

CLASS 73

1 J	4,324,126
3	4,324,127
8	4,324,128
15 A	4,324,129
17 R	4,324,130
61.1 C	4,324,131
61.3	4,324,132
117	4,324,133
117.1	4,324,134
159	4,324,136
187	4,324,135
189	Re.30,900
341	4,324,138
362 CP	4,324,137
457	4,324,139
602	4,324,140
626	4,324,142
627	4,324,141
861.62	4,324,143
861.77	4,324,144
861.89	4,324,145
863.12	4,324,146
864.31	Re.30,901

CLASS 74

37	4,324,147
108	4,324,148
473 R	4,324,149
476	4,324,150
532	4,324,151
606 R	4,324,152
834	4,324,155
866	4,324,153
869	4,324,154
	4,324,156

CLASS 75

1 R	4,324,582
43	4,324,583
60	4,324,584
68 B	4,324,585
69	4,324,586
130 B	4,324,587
208 R	4,324,588

CLASS 81

57.17	4,324,157
60	4,324,158
111	4,324,159
185	4,324,160

CLASS 82

2 R	4,324,161
2.5	4,324,162

CLASS 83

855	4,324,163

CLASS 84

1.04	4,324,164
318	4,324,165
454	4,324,166

CLASS 89

1.8	4,324,167
1.814	4,324,168
36 L	4,324,169
159	4,324,170

CLASS 92

169	4,324,171

CLASS 99

277.1	4,324,172
330	4,324,173
421 H	4,324,174
519	4,324,175

CLASS 100

3	4,324,176
155 R	4,324,177

CLASS 101

45	4,324,178
170	4,324,179
216	4,324,180
269	4,324,181

CLASS 102

217	4,324,182
334	4,324,183

CLASS 104

279	4,324,184
283	4,324,185

CLASS 105

177	4,324,186
199 A	4,324,187
282 R	4,324,188
378	4,324,189

CLASS 106

1.22	4,324,589
35	4,324,590
85	4,324,591
	4,324,592
203	4,324,593

CLASS 108

51.1	4,324,190

CLASS 112

277	4,324,191

CLASS 114

106	4,324,192
199	4,324,193
264	4,324,194
312	4,324,195

CLASS 116

277	4,324,196
300	4,324,197

CLASS 118

630	4,324,198
658	4,324,199

CLASS 119

2	4,324,200
14.51	4,324,201
51 R	4,324,202
51.11	4,324,203
96	4,324,204
	4,324,205
99	4,324,206

CLASS 122

448 B	4,324,207

CLASS 123

25 B	4,324,209
90.55	4,324,210
143 A	4,324,211
179 F	4,324,212
195 C	4,324,208
196 A	4,324,213
309	4,324,214
335	4,324,215
415	4,324,216
417	4,324,217
440	4,324,218
620	4,324,219

CLASS 124

18	4,324,220
24 R	4,324,221
89	4,324,222

CLASS 126

200	4,324,223
422	4,324,224
425	4,324,225
429	4,324,226
437	4,324,227
	4,324,228
439	4,324,229
443	4,324,230
449	4,324,231
450	4,324,232

CLASS 128

58	4,324,233
202.14	4,324,234
207.15	4,324,235
214 G	4,324,238
214 R	4,324,236
	4,324,237
	4,324,239
218 PA	4,324,241
232	4,324,242
276	4,324,243
	4,324,244
287	4,324,245
	4,324,246
	4,324,247
325	4,324,248
360	4,324,249
395	4,324,250
419 PG	4,324,252
419 PT	4,324,251
421	4,324,253
494	4,324,254
630	4,324,255
635	4,324,256
	4,324,257
663	4,324,258
722	4,324,259
728	4,324,260
740	4,324,261
756	4,324,262

CLASS 132

7	4,324,263

CLASS 134

2	4,324,594
38	4,324,595
68	4,324,264
82	4,324,265

CLASS 136

242	4,324,945
247	4,324,946
248	4,324,947

CLASS 137

13	4,324,266
100	4,324,267
312	4,324,268
315	4,324,269
317	4,324,270
493	4,324,271
574	4,324,272
625.39	Re.30,902
625.43	4,324,273
625.68	4,324,274
876	4,324,275

CLASS 138

30	4,324,276

CLASS 144

312	4,324,277

CLASS 148

11.5 A	4,324,596
103	4,324,597
111	4,324,598

CLASS 149

39	4,324,599

CLASS 152

213 R	4,324,278
314	4,324,279
349	4,324,280
359	4,324,281

CLASS 156

64	4,324,600
69	4,324,601
71	4,324,602
131	4,324,604
247	4,324,605
272.2	4,324,606
350	4,324,607
351	4,324,608
470	4,324,609
584	4,324,603
602	4,324,610
643	4,324,611

CLASS 157

1.22	4,324,282
1.28	4,324,283

CLASS 160

172	4,324,284

CLASS 162

23	4,324,612
111	4,324,613

CLASS 165

2	4,324,285
	4,324,286
10	4,324,287
22	4,324,288
48 S	4,324,289
173	4,324,290

CLASS 166

252	4,324,291
261	4,324,292
317	4,324,293

CLASS 169

13	4,324,294

CLASS 172

28	4,324,295
49.5	4,324,123
311	4,324,296

CLASS 174

71 R	4,324,949

CLASS 175

45	4,324,297
64	4,324,298
107	4,324,299
379	4,324,300

CLASS 179

1 A	4,324,950
1 B	4,324,951
1 GS	4,324,952
17 A	4,324,953
27 FH	Re.30,903
90 B	4,324,954

CLASS 180

2 R	4,324,301
8 C	4,324,302
9.5	4,324,303
9.52	4,324,304
134	4,324,305
228	4,324,306
313	4,324,307
315	4,324,308
316	4,324,309

CLASS 181

116	4,324,310
120	4,324,311
171	4,324,312
192	4,324,313
230	4,324,314

CLASS 184

15 R 4,324,315
29 4,324,316

CLASS 187

25 4,324,317

CLASS 188

73.31 4,324,318
79.5 K 4,324,319
271 4,324,320

CLASS 192

0.032 4,324,322
13 R 4,324,321
64 4,324,323
101 4,324,324

CLASS 194

4 C 4,324,325

CLASS 198

461 4,324,326
497 4,324,327

CLASS 200

5 E 4,324,955
16 C 4,324,957
16 F 4,324,958
16 R 4,324,956
144 AP 4,324,959
144 B 4,324,960
150 R 4,324,961
159 B 4,324,962
318 4,324,963
331 4,324,964

CLASS 202

89 4,324,620

CLASS 204

1 T 4,324,621
15 4,324,623
67 4,324,624
72 4,324,625
146 4,324,626
158 HA 4,324,627
159.24 4,324,628
180 P 4,324,629
192 M 4,324,631
192 R 4,324,630
195 P 4,324,632
206 4,324,633
228 4,324,634
266 4,324,635
296 4,324,636

CLASS 206

194 4,324,328
328 4,324,329
4,324,330
363 4,324,331
454 4,324,332
526 4,324,333

CLASS 208

8 LE 4,324,637
4,324,638
4,324,639
4,324,640
4,324,641
4,324,642
4,324,643
4,324,644
50 4,324,645
71 4,324,646
111 4,324,647
114 4,324,648
130 4,324,649
206 4,324,650
309 4,324,651

CLASS 209

3 4,324,652
166 4,324,654
167 4,324,653
459 4,324,334
586 4,324,335
589 4,324,336

CLASS 210

96.1 4,324,655
170 4,324,656
197 4,324,657
321.3 4,324,658
386 4,324,659
440 4,324,660
635 4,324,661
646 4,324,662
4,324,663
701 4,324,664
718 4,324,665
722 4,324,666
729 4,324,667

CLASS 211

89 4,324,337

CLASS 215

6 4,324,338
219 4,324,339

CLASS 219

10.55 B 4,324,966
10.55 F 4,324,965
4,324,967
4,324,968
69 C 4,324,969
69 W 4,324,970
121 EA 4,324,973
121 FS 4,324,972
121 PV 4,324,971
553 4,324,974

CLASS 220

1 R 4,324,340
258 4,324,341
268 4,324,342
270 4,324,343
333 4,324,344

CLASS 221

41 4,324,345
171 4,324,346
237 4,324,347

CLASS 222

181 4,324,348
207 4,324,349
212 4,324,350
402.11 4,324,351

CLASS 223

91 4,324,352

CLASS 226

118 4,324,353
189 4,324,354
190 4,324,355

CLASS 228

193 4,324,356

CLASS 229

37 E 4,324,357

CLASS 235

70 A 4,324,975
145 R 4,324,976

CLASS 236

49 4,324,358

CLASS 237

46 4,324,359

CLASS 238

349 4,324,360

CLASS 239

3 4,324,361
211 4,324,362
284 A 4,324,363
383 4,324,364
424 4,324,365
533.1 4,324,366

CLASS 241

60 4,324,367

CLASS 242

18 PW 4,324,368
66 4,324,369
86.52 4,324,370
153 4,324,371
192 4,324,372

CLASS 244

121 4,324,373
158 R 4,324,374
163 4,324,375

CLASS 246

125 4,324,376

CLASS 248

37.6 4,324,377
184 4,324,378
222.1 4,324,379
302 4,324,380
311.2 4,324,381
406 4,324,382

CLASS 250

222 R 4,324,977
370 Re.30,904
445 T 4,324,978
505 4,324,979
4,324,980
551 4,324,981
560 4,324,982

CLASS 251

308 4,324,383

CLASS 252

8.55 C 4,324,668
4,324,669
37.7 4,324,670
49.6 4,324,671
49.7 4,324,672
51.5 R 4,324,673
78.5 4,324,674
79 4,324,675
4,324,676
99 4,324,677
136 4,324,678
182 4,324,679
182.1 4,324,680
184 4,324,681
301.27 4,324,682
316 4,324,683
389 A 4,324,684
408 4,324,685
4,324,686
4,324,687
417 4,324,688
428 4,324,689
429 B 4,324,690
4,324,691
4,324,692
4,324,693
435 4,324,694
437 4,324,695
455 Z 4,324,696
4,324,697
4,324,698
463 4,324,699
472 4,324,700
477 R 4,324,701
519 4,324,702
522 R 4,324,703
4,324,704

CLASS 254

8 B 4,324,384
270 4,324,385
288 4,324,386
310 4,324,387

CLASS 256

19 4,324,388

CLASS 260

152 4,324,719
185 4,324,720
196 4,324,721
207 4,324,722
207.1 4,324,723
239 E 4,324,724
343.6 4,324,725
4,324,726
4,324,727
345.2 4,324,728
345.9 R 4,324,729
346.22 4,324,730
4,324,731
402.5 4,324,733
403 4,324,734
425 4,324,735
429 R 4,324,736
429.7 4,324,737
465 H 4,324,738
465.4 4,324,739
502.4 R 4,324,740
505 C 4,324,742
505 R 4,324,741
513 N 4,324,743
932 4,324,744

CLASS 261

39 E 4,324,745
51 4,324,746
112 4,324,749

CLASS 264

13 4,324,747
23 4,324,751
25 4,324,752
51 4,324,748
61 4,324,750
121 4,324,753
268 4,324,754
312 4,324,755
322 4,324,756

CLASS 266

51 4,324,389
155 4,324,390
200 4,324,391
240 4,324,392

CLASS 269

46 4,324,393

CLASS 271

5 4,324,394
98 4,324,395
125 4,324,396
217 4,324,397

CLASS 272

123 4,324,398
144 4,324,399

CLASS 273

76 4,324,400
85 G 4,324,401
88 4,324,402
127 R 4,324,403
169 4,324,404
238 4,324,405
242 4,324,406

CLASS 277

27 4,324,407

CLASS 280

7.13 4,324,408
12 F 4,324,409
42 4,324,410
43.23 4,324,411
163 4,324,412
205 4,324,413
242 WC 4,324,414
605 4,324,415
661 4,324,416
678 4,324,417
802 4,324,418
804 4,324,419

CLASS 282

27.5 4,324,420

CLASS 283

7 4,324,421

CLASS 285

140 4,324,422
156 4,324,423
158 4,324,424

CLASS 290

1 R 4,324,983
54 4,324,984
55 4,324,985

CLASS 292

201 4,324,425
281 4,324,426

CLASS 293

106 4,324,427

CLASS 294

169 4,324,428

CLASS 296

100 4,324,429

CLASS 297

250 4,324,430
284 4,324,431
377 4,324,432
442 4,324,433

CLASS 298

27 4,324,434

CLASS 299

37 4,324,435

CLASS 303

22 R 4,324,436

CLASS 305

11 4,324,437

CLASS 307

10 LS 4,324,986
35 4,324,987
221 D 4,324,988
252 J 4,324,989
350 4,324,990
443 4,324,991

CLASS 308

3.5 4,324,438
3.8 4,324,439
26 4,324,440
177 4,324,441
187 4,324,442
187.1 4,324,443
201 4,324,444

CLASS 310

49 R 4,324,992
58 4,324,993
68 R 4,324,994
153 4,324,995
156 4,324,996
248 4,324,997

CLASS 312

236 4,324,445
245 4,324,446

CLASS 313

318 4,324,998
336 4,324,999
4,325,000
348 4,325,001
485 4,325,002

CLASS 315

39.51 4,325,003
45 4,325,004
111.81 4,325,005
112 4,325,006
200 A 4,325,007
241 R 4,325,008
386 4,325,009
73 B1 4,032,816

CLASS 316

17 4,324,447

CLASS 318

139 4,325,010
345 B 4,325,011
578 4,325,013
614 4,325,014
625 4,325,015
640 4,325,016
786 4,325,012

CLASS 323

313 4,325,017
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137 4,325,094

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156 4,324,494
271 4,324,495

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255 4,325,131
256 4,325,132
263 4,325,133

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321 R 4,324,774
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86 4,324,814
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150 4,324,817
174 4,324,818
283 4,324,819
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290 4,324,833
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245 4,324,853
296 4,324,854
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462 4,324,916
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